BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 99-102

1 JULY 1998

Test and Evaluation

OPERATIONAL TEST AND EVALUATION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the SAF/AAD WWW site at: http://afpubs.hq.af.mil. If you lack access, contact your Publishing Distribution Office (PDO).

OPR: HQ USAF/TEP (Lt Col T. Corbett)
Certified by: HQ USAF/TE (John T. Manclark)
Supersedes AFI 99-102, 22 July 1994
Pages: 73
Distribution: F

This instruction implements Air Force Policy Directive (AFPD) 99-1, Test and Evaluation Policy. It provides mandatory policy and direction for managing all operational test and evaluation (OT&E) programs in the Air Force, and should be used in conjunction with Air Force Instruction (AFI) 99-101, Developmental Test and Evaluation. It describes planning, conducting, and reporting cost-effective OT&E to support acquisition and sustainment program decisions and actions throughout a system's life cycle. It implements Department of Defense (DoD) Directive 5000.1, Defense Acquisition, 15 March, 1996, and Department of Defense Regulation 5000.2-R, Mandatory Procedures for Major Defense Acquisition Programs (MDAP) and Major Automated Information System (MAIS) Acquisition Programs, 15 March, 1996. Additional mandatory policy and direction are contained in AFI 10-601, and the 63- and 99-series AFIs. Nonmandatory information is contained in the DoD Acquisition Deskbook and Air Force Pamphlet (AFPAM) 99-116, Test and Evaluation Management Guide (in development). Air Force implementing, operating, and supporting commands or agencies may supplement this instruction. This instruction also applies to the Air National Guard and Air Force Reserve Command (AFRC). Send proposed major command (MAJCOM) OT&E instructions and supplements to HQ USAF/TEP with an information copy to HQ AFOTEC/XP. HQ USAF/TE is the sole waiver authority for this instruction. Submit recommended changes via AF Form 847, Recommendation for Change of Publication, to HQ USAF/TEP with an information copy to HQ AFOTEC/XP.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This document is substantially revised and must be completely reviewed. It updates AFI 99-102, 1 June 1994, which replaced AFR 80-14, AFR 55-43, and AFR 80-19. These revisions resulted from the updated DoD 5000-series (DoDD 5000.1 and DoD 5000.2-R) published on 15 March 96. The principal revisions are: the acquisition milestones (MS) and phases were renamed; acquisition category (ACAT) IV and MS

IV were eliminated; the analysis of alternatives (AoA) replaced the cost and operational effectiveness analysis (COEA); the integrated product team (IPT) became the primary forum for managing all aspects of acquisition programs; test and evaluation in support of sustainment (after MS III) was clarified; the definition of follow-on operational test and evaluation (FOT&E) was modified; the new concept and term "Force Development Evaluation" (FDE) were added; the term "specification" was changed to "performance-based requirement" where appropriate; and all definitions and references were updated. New policy and directions were added about: the test process; waivers for use of nongovernment test facilities; certification of system readiness for dedicated OT&E; the deficiency reporting (DR) system; contractor involvement in operational testing; protection of developmental test and evaluation (DT&E) data used for OT&E; the Single Acquisition Management Plan (SAMP); modeling and simulation; evolutionary and incremental acquisition strategies; advanced concept technology demonstrations (ACTD); and combined DT&E/OT&E. Some nondirective information was relocated to AFPAM 99-116, and all remaining policy and direction were reorganized along subject matter lines.

Chapter 1

GENERAL TEST GUIDANCE AND EVALUATION

1.1. The Purpose of Test and Evaluation (T&E). The primary function of T&E is to determine if systems are effective and suitable, and to identify and resolve deficiencies as early as possible. The Air Force will conduct T&E to support the acquisition, modification, fielding, upgrade, and sustainment of weapon systems and product groups. The operational test agency (OTA) will determine if systems and product groups meet Air Force peacetime and wartime missions by:

1.1.1. Providing timely, accurate, and affordable information to decision makers and users so they may assess whether a system or technique is useful and cost-effective to the military.

1.1.2. Identifying and resolving deficiencies early.

1.1.3. Supporting decision makers and users in assessing how to best employ limited resources.

1.1.4. Reducing risks during the acquisition and sustainment phases of systems' life cycles.

1.1.5. Ensuring the acquisition community delivers operationally effective and suitable systems to Air Force users.

1.1.6. Ensuring systems continue to be operationally effective and suitable (sustained) throughout their life cycles.

1.1.7. Giving operational users the information needed to develop tactics, doctrines, procedures, and system enhancements.

1.2. Types of T&E. There are two major types of T&E in the defense system acquisition process: developmental test and evaluation (DT&E); and operational test and evaluation (OT&E). DT&E and OT&E will be combined when possible and appropriate; however, a dedicated phase of OT&E is normally required before the full-rate production decision. Follow-on operational test and evaluation (FOT&E) is done after the production decision to answer questions remaining from the acquisition process.

1.3. The T&E Process. The T&E process is based on the scientific method and the principle of "predict - test - compare" as shown in **Figure 1.1.** The Air Force acquisition and test communities will apply the T&E process throughout the system life cycle to identify and resolve deficiencies, and evaluate system effectiveness and suitability. The core elements of the T&E process are described below:

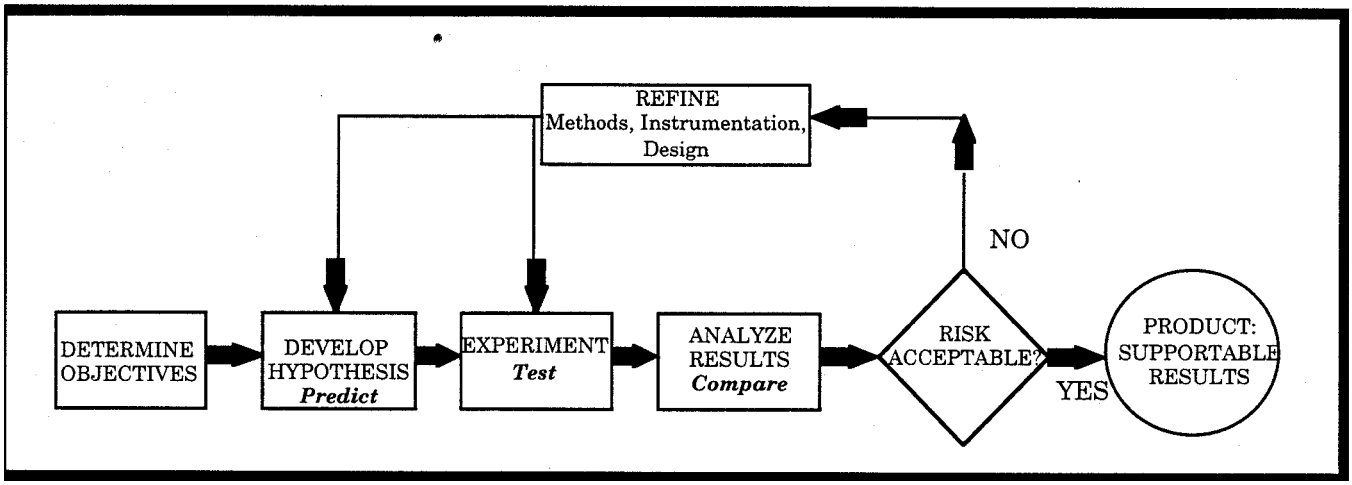
1.3.1. The Scientific Method. The T&E process uses the scientific method to build experiments or tests as follows: a model or hypothesis is developed as a prediction of performance; the experiment or test is executed; and the data analyzed and compared to the original model, hypothesis, or prediction. If the identified risk is acceptable, the experiment or test is complete. If the risk is not acceptable, refinements are made to one or more of the following: the system's design; the system's operating concept; the experiment's design (e.g., test methods, models, simulations, digital system models (DSM), test instrumentation, or data analysis methods); or the original prediction. The test may then be repeated. Air Force acquisition and test personnel will use the T&E process to identify and resolve problems early, decrease acquisition program risk, and increase decision maker confidence in acquisition program results.

1.3.2. Predict. This part of the T&E process is supported by modeling and simulation (M&S) and the results of previous testing. Digital system models are foundational to the T&E process because they help testers do the following: develop viable T&E concepts; replicate threats; predict results prior to open-air testing; predict and explore potential problems for early resolution; build confidence that new systems will meet operational requirements; and reduce the amount of actual testing needed. Typically during this step, a model of the system under test interacts with environmental, threat, and other weapon system models to estimate and predict system performance.

1.3.3. Test. Testing obtains or verifies data for determining the degree to which systems meet stated requirements and pre-test predictions. Testing also identifies and verifies the correction of deficiencies. This part of the T&E process is supported by test facilities, M&S, field testing, and range instrumentation to produce and record data from testing.

1.3.4. Compare. This part of the T&E process compares measured test data to predicted results, followed by evaluation of the differences found. As these differences are reduced, confidence is gained about the design and performance of the model. This part of the T&E process is supported by requirements documents, test plans, test results, DSMs, analytical and statistical tools, evaluations, and summaries from current and previous test projects. Test reports will be concise, timely, and contain critical information needed by decision makers.

Figure 1.1. The Test and Evaluation Process.



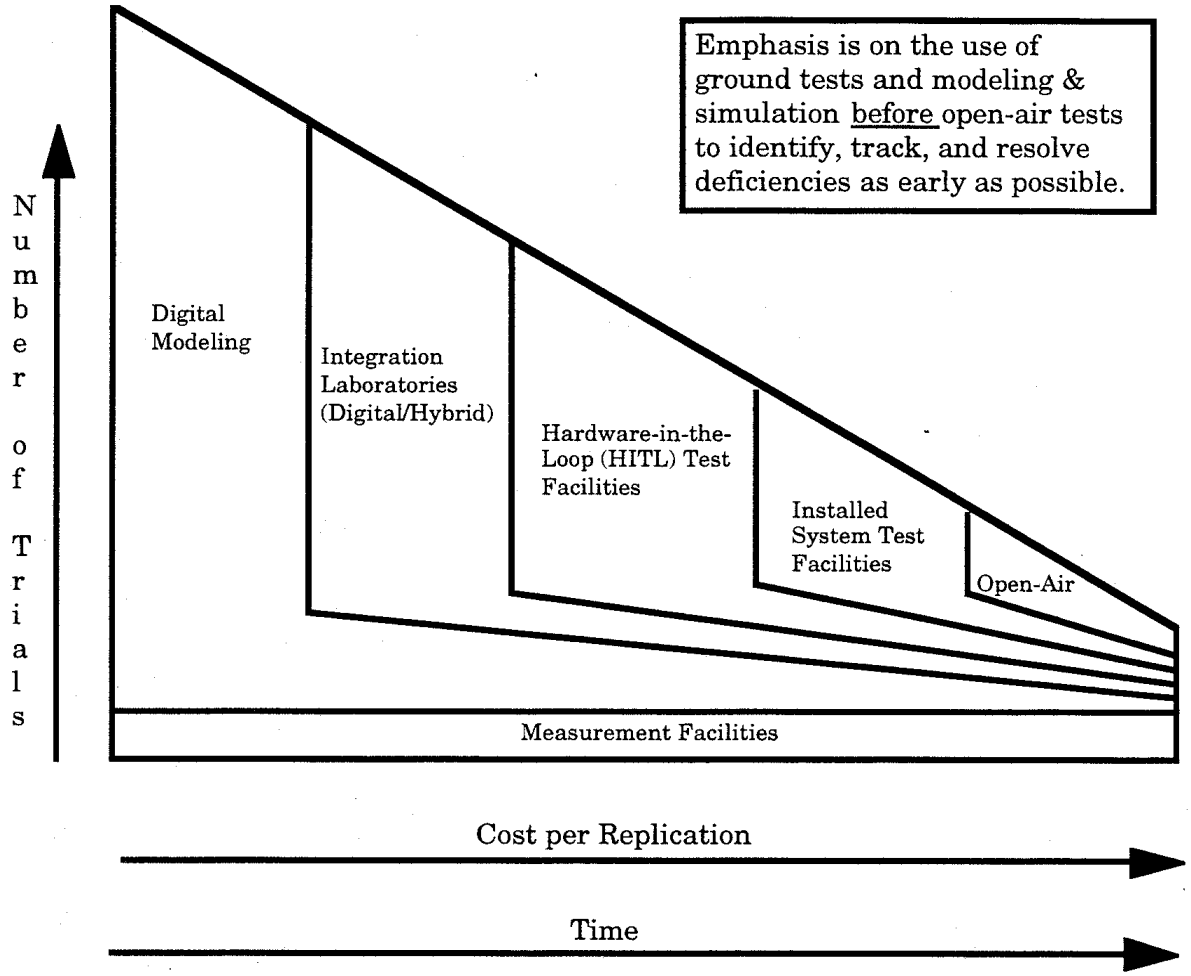
NOTE:

Early problem identification and resolution must take place at all stages of development.

1.4. Test Capabilities, Facilities, and Instrumentation The major types of capabilities, facilities, and instrumentation used in the T&E process are shown in **Figure 1.2.** System design begins with M&S tools capable of numerous low cost replications, progresses through integrated facilities of higher cost and complexity, but with fewer replications, and finishes with highly selective testing in realistic, open-air environments. Use of DSMs should be consistent with Air Force approved infrastructure initiatives and system architectures such as Joint Modeling and Simulation System (J-MASS), Joint Simulation Systems (JSIMS), and Joint Warfare Systems (JWARS). Each step predicts results for the next step in the system design, and reduces unnecessary and increasingly costly tests later in the program. OT&E activities are

predominantly conducted in realistic, open-air environments, but are increasingly reliant for support on the full spectrum of test capabilities and facilities. See AFPAM 99-116, *Test and Evaluation Management Guide*, for more details.

Figure 1.2. Hierarchy of T&E Capabilities, Facilities, and Instrumentation.



Chapter 2

OPERATIONAL TEST AND EVALUATION

2.1. The Purpose of Operational Test and Evaluation (OT&E). Various kinds of OT&E are conducted during a system's life cycle to ensure the Air Force acquires and maintains operationally effective and suitable systems which meet user requirements. OT&E will be conducted in as realistic an operational environment as possible and practical, and to identify and help resolve deficiencies as early as possible. These conditions must be representative of both combat stress and peacetime operational conditions. Operational testers will use modeling and simulation (M&S) to the maximum extent practical as a tool to help plan, augment, extend, or enhance field test results. Operational testers will conduct OT&E in order to:

2.1.1. Determine and report operational effectiveness and operational suitability.

2.1.2. Identify, track, and help resolve deficiencies as early as possible, and identify enhancements.

2.1.3. Identify quality, reliability, maintainability, and safety problems and propose solutions.

2.1.4. Provide information for identifying and refining logistics and software support requirements.

2.1.5. Provide information on organizational structure, personnel requirements, support equipment, technical publications, training, training systems, tactics, and doctrine.

2.1.6. Recommend and evaluate changes in system configuration.

2.1.7. Provide information for refining operations and maintenance (O&M) cost estimates, or identify system characteristics or deficiencies that affect O&M costs.

2.1.8. Determine if support equipment, training, and technical publications support the system and the mission.

2.1.9. Assess the survivability and/or lethality of the system in the operational environment.

2.1.10. Evaluate system compatibility, interoperability, and integration (CII).

2.2. Types of Operational Test and Evaluation (OT&E). This AFI uses the general term "OT&E" to cover a broad range of T&E activities conducted during all phases of a system's life cycle. It supports virtually every new or fielded system at various points in its life cycle. OT&E is conducted and reported independently of the developer, user, and system contractor. Some OT&E programs may not fall precisely into one of the OT&E types described below. In such cases, use sound judgment to pick the best type of OT&E that fits the situation and tailor to meet the need (see paragraph **6.6.**). The test process guidance in this AFI will be used to conduct all OT&E, as appropriate.

2.2.1. Initial Operational Test and Evaluation (IOT&E). IOT&E is conducted to determine the operational effectiveness and suitability of systems undergoing research and development (R&D) efforts. IOT&E supports the following types of decisions: proceeding beyond low-rate initial production (LRIP); Milestone (MS) III; fielding; and declaration of initial operational capability (IOC). A dedicated phase of IOT&E is required for acquisition category (ACAT) I and II programs, and strongly recommended for all others. IOT&E will be planned to completely and unambiguously answer all critical operational issues (COI) as thoroughly as possible, and will not defer testing into follow-on OT&E (FOT&E) unless unavoidable. In addition, IOT&E:

2.2.1.1. Begins as early as practical in the systems engineering development program.

2.2.1.2. Identifies, tracks, reports, and helps resolve design and other deficiencies as early as possible. Also identifies enhancements.

2.2.1.3. Evaluates systems against user-validated operational requirements.

2.2.1.4. Determines how well the system accomplishes the mission essential tasks.

2.2.1.5. Tests under conditions that are as operationally realistic as possible and practical.

2.2.1.6. Uses operationally representative personnel, and production or production representative test articles.

2.2.1.7. Assesses system survivability and/or lethality against realistic threat representative forces, targets, and threat countermeasures where applicable.

2.2.1.8. Answers COIs and determines if operational requirements were met within the context of the mission supported.

2.2.1.9. Uses research, development, test and evaluation (RDT&E) (3600) funds.

2.2.1.10. Is conducted and reported independently of the developer, user, and system contractor by the Air Force Operational Test and Evaluation Center (AFOTEC).

2.2.2. Qualification Operational Test and Evaluation (QOT&E). QOT&E is the name used for OT&E when no significant research and development (R&D) is required. It is used when evaluating military-unique portions and military applications of commercial off-the-shelf (COTS), nondevelopmental items (NDI), and government furnished equipment (GFE). (NOTE: Commercial and nondevelopmental items are also called CANDI.) QOT&E planning and conduct are held to the same standards and policies as IOT&E. QOT&E may support evolutionary and incremental acquisition strategies, as well as the decisions for going beyond LRIP, MS III, fielding, and IOC. Candidate systems for QOT&E require little or no government funded R&D, engineering, design, or integration efforts. In addition, QOT&E:

2.2.2.1. May use commercially available T&E information for evaluating any non-military-unique areas.

2.2.2.2. Is usually completed before the first production article is fielded or deployed for military use.

2.2.2.3. Is funded with Operations and Maintenance (O&M) (3400) or Procurement (e.g., 3010, 3020, or 3080) funds.

2.2.2.4. Is conducted by AFOTEC using the same policies as for IOT&E.

2.2.3. Follow-on Operational Test and Evaluation (FOT&E). FOT&E is the continuation of IOT&E or QOT&E activities past the MS III decision. FOT&E answers specific questions about unresolved COIs and test issues, or completes areas not finished during the I/QOT&E. These areas are officially deferred by the Milestone Decision Authority (MDA) or HQ USAF at the MS III decision for further testing by the designated test agency. FOT&E ensures the system acquisition process is complete. FOT&E will not be intentionally used as a backup for incomplete or poorly planned I/QOT&E. In addition, FOT&E:

2.2.3.1. Completes those portions of the system's preplanned research and development (R&D) program that could not be finished during IOT&E or QOT&E.

2.2.3.2. Verifies correction of deficiencies identified during IOT&E or QOT&E, if possible.

2.2.3.3. Refines early, rough estimates from the IOT&E or QOT&E.

2.2.3.4. Is conducted and reported independently of the developer, user, and contractor.

2.2.3.5. Is directed in the acquisition decision memorandum (ADM) or similar document.

2.2.3.6. Addresses questions and needs of milestone decision authorities (MDA).

2.2.3.7. Is generally conducted with RDT&E (3600) funds for deferred R&D tasks. O&M (3400) or Procurement (e.g., 3010, 3020, or 3080) funds are used for test articles and test support.

2.2.3.8. Is conducted by AFOTEC using the same policies as for IOT&E.

2.2.4. Combined DT&E and OT&E. A combined DT&E/OT&E approach and combined test force (CTF) will be used to the maximum extent possible (see paragraph **6.7.**). The combined DT&E/OT&E approach must not compromise either developmental or operational test objectives, and a final independent phase of dedicated OT&E is required for fielding and beyond LRIP decisions. The combined DT&E/OT&E approach and CTF structure will be described in the test and evaluation master plan (TEMP). See AFI 99-101, *Developmental Test and Evaluation*, for information about DT&E.

2.2.5. Multiservice Operational Test and Evaluation (MOT&E). MOT&E is conducted with another service's OTA or other government agency support for multiservice or multiagency acquisitions. MOT&E will be conducted according to the T&E directives of the lead service or agency, or as agreed in a memorandum of agreement (MOA) between the participants. For more details, see paragraph **6.12.** and the *Memorandum of Agreement on Multiservice Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation (JT&E).*

2.3. Other OT&E-Related Activities. Some OT&E programs may not fall precisely into one of the OT&E types previously described. In such cases, use sound judgment to select one of the following alternatives which best fits the situation, and tailor to meet the need (see paragraph **6.6.**).

2.3.1. Operational Assessment (OA). The OA is a management tool used to assess and report on the system's potential to meet user requirements, on the acquisition program's progress toward OT&E, or on system readiness for LRIP. They are progress reports, not test and evaluation. AFOTEC should conduct OAs as precursors to IOT&E or QOT&E to provide operational information to developers, users, and decision makers early in the program. Actual systems, subsystems, key components, or operationally meaningful surrogates will be used whenever possible. Operational assessments are generally funded with RDT&E (3600) funds. AFOTEC will conduct OAs as described in Department of Defense (DoD) 5000.2-R, or as directed by HQ USAF/TE. OAs will not be conducted as substitutes for IOT&E or QOT&E. AFOTEC will focus OAs on the following kinds of information:

2.3.1.1. Significant trends in program development with emphasis on programmatic voids and areas of risk.

2.3.1.2. Identification of any areas adversely impacting the capability to meet operational requirements.

2.3.1.3. Review of the adequacy of operational requirements and operational concepts for test purposes.

2.3.1.4. Capability of programs to support planned operational testing.

2.3.1.5. Support for long-lead decisions.

2.3.1.6. Answers to specific questions or issues raised by senior decision makers.

2.3.2. Early Operational Assessment (EOA). EOAs are similar to OAs, but are conducted prior to MS II, or as directed by HQ USAF/TE or the program management directive (PMD).

2.3.3. Operational Utility Evaluation (OUE). OUEs are highly streamlined, tailored OT&E activities designed to obtain quick-look assessments of military capabilities and limitations. They are flexible in planning and reporting formats, adjustable to customer needs, and funded with the same type of appropriation as the parent program. OUEs are specifically limited in time and scope without excessive expenditure of resources. Customers must understand that OUEs will not afford the same rigor as an IOT&E, QOT&E, or FOT&E. OUEs will only be used when an IOT&E, QOT&E, or FOT&E cannot be tailored to meet unusual test program needs. OUEs cannot be used to: replace IOT&Es, QOT&Es, or FOT&Es which require more rigorous analysis; support fielding, production, or full-rate buy decisions at MS III; or evaluate ACAT I, II, or OSD oversight programs. OUEs are requested by HQ USAF/TE, the user, the single manager (SM), the Service Acquisition Executive (SAE), the program executive officer (PEO), or OTA commander. In addition, OUEs are used to:

2.3.3.1. Help reduce the scope of subsequent OT&E efforts.

2.3.3.2. Validate (demonstrate) an operational concept.

2.3.3.3. Obtain a quick-look of a system's military capabilities and limitations, the results of which can provide information to decision makers about initiating or continuing an acquisition program.

2.3.3.4. Support assessments (e.g., an AoA) of competing concepts or alternatives, and support source selections.

2.3.3.5. Expand the mission of an existing or modified system, and identify deficiencies.

2.3.3.6. Determine how well nonfielded systems meet mission needs or satisfy operational requirements.

2.3.3.7. Evaluate ACTDs or new applications of existing technologies.

2.3.3.8. Support proof of concept initiatives from USAF Battlelabs.

2.3.4. Force Development Evaluation (FDE). FDE is focused on the MAJCOMs' requirement for the operational employment and sustainment of systems after the initial acquisition process, I/QOT&E, and/or FOT&E are complete. It is the evaluation, demonstration, exercise, or analysis of fielded, operational systems throughout the system life cycle. MAJCOM system operators use the materiel and force development processes to ensure their systems continue meeting operational needs by examining doctrine, operational concepts, system performance, procedures, tactics, training, organization, personnel, the logistics elements, and materiel issues, among other things. See AFI 99-150, *Combat Air Forces Test and Evaluation* (in development), for details. In addition, FDE:

2.3.4.1. Helps refine employment doctrine and tactics in response to changing threats.

2.3.4.2. Helps develop or refine operational procedures and training programs.

2.3.4.3. Evaluates changes and verifies correction of new deficiencies discovered after system deployment.

2.3.4.4. Explores non-materiel means of satisfying changing operational requirements during system sustainment.

2.3.4.5. Evaluates routine software block cycle changes (operational flight programs [OFP]), preplanned product improvements (P3I), modifications, upgrades, mission data updates, and other improvements or changes during sustainment.

2.3.4.6. Evaluates operational systems against Foreign Materiel Equipment (FME) and new threat systems.

2.3.4.7. Addresses questions and needs of operational users using the same policies as for IOT&E and FOT&E.

2.3.4.8. May be conducted concurrently with FOT&E.

2.3.4.9. Is conducted by the MAJCOM with O&M (3400) or Procurement (e.g., 3010, 3020, or 3080) funds.

2.3.5. Tactics Development and Evaluation (TD&E). TD&E is a subset of FDE specifically designed to further exploit system capabilities and tactics during the sustainment portion of the system's life cycle. It includes the research, demonstration, exercise, analysis, and evaluation of specific employment tactics against anticipated threats. TD&E uses the same policies and accomplishes many of the same goals as FDE.

2.3.6. Weapons System Evaluation Program (WSEP). WSEP is a formal subset of FDE designed to provide realistic "end-to-end" evaluation of air-to-ground and air-to-air weapon systems and all supporting systems. The operating MAJCOMs conduct WSEP to ensure proper weapon system performance in combat by providing training, and information on operational capabilities and limitations, operational suitability, dormant reliability, force structure, required modifications, and new requirements. See AFI 99-108, *Programming and Reporting Missile and Target Expenditures in Test and Evaluation.*

2.3.7. Foreign Comparative Testing (FCT). FCT is conducted on foreign nations' systems, equipment, and technologies to determine their potential to satisfy validated U.S. operational requirements. System development and test costs are potentially reduced. Operating commands will nominate FCT candidates to the Office of the Secretary of Defense, OUSD(A&T)/DTSE&E, who provides funding and direction for the T&E of selected programs. Operational testers will participate in FCT programs as directed in the PMD. More information about FCT is found in DoD 5000.3-M-2, *Foreign Comparative Testing (FCT) Program*.

2.3.8. Advanced Concept Technology Demonstration (ACTD). ACTDs are a means of demonstrating the use of maturing or leading-edge technologies to meet potential military needs. They provide a mechanism for rapid transition of emerging technologies to operational use. ACTDs are not a formal part of the acquisition process or formal operational test efforts, but "demonstrations" under the direction of an ACTD user-sponsor. ACTDs may require inputs from operational testers who will assist in demonstration planning and execution, and help ensure operational realism. ACTDs also help users develop ORDs and operational concepts of employment.

2.3.9. Battlelab Initiative (BI). Battlelab initiatives are innovative or revolutionary operations or logistics concepts capable of improving the Air Force's capability to execute its core competencies. They may drive later changes to Air Force organization, doctrine, training, requirements, or acquisitions. BIs are not a formal part of the acquisition process or formal operational tests, but are "demonstrations" under the direction of the sponsoring battlelab(s). BIs require inputs from operational testers who will assist in demonstration planning and execution. AFOTEC is the primary source of OT&E expertise in support of BIs. AFOTEC will program for BI activities to include demonstration resource support. Battlelab demonstration activities are conducted using O&M (3400) or Procurement (e.g., 3010, 3020, or 3080) funds. More information about BIs is found in AFI 10-1901, *Air Force Battlelab Responsibilities, Processes, and Documentation.*

2.3.10. Joint Test and Evaluation (JT&E). Operational testers will conduct JT&E programs to evaluate system operational or technical performance under realistic conditions which are of interest to more than one service. Doctrine, tactics, and procedures are also developed and evaluated. JT&E programs are different from MOT&E programs in these respects: candidate JT&E programs are nominated by the services; they are directed and funded by OSD/DTSE&E; they usually do not result in the acquisition of systems. For more details, see AFI 99-106, *Joint Test and Evaluation,* and the *Memorandum of Agreement on Multiservice Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation (JT&E).*

2.4. Certification of Readiness for Dedicated Operational Test and Evaluation (OT&E). DoD 5000.2-R requires a certifying official from the developing agency to formally certify systems are ready to enter the dedicated phase of OT&E. Operational testers will participate in the certification process described in AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation.* The certification process is a continuous effort, not a single event in time, and will be used for reviewing all programs regardless of ACAT. To be most effective, the process must be started as early as practical in new development programs. Before dedicated OT&E starts, a corporate Air Force decision is required from all the certification process participants. See paragraph **6.29.**.

2.5. Requests to Modify the Provisions for OT&E. Requests to modify (waive) the fundamental provisions of this AFI for any OT&E must be submitted in writing, with user and developer concurrence, through AFOTEC/CV to HQ USAF/TE. The SM will document any approved OT&E "waivers" in the TEMP, and the system's program element monitor (PEM) will document OT&E "waivers" in the PMD.

Chapter 3

MANAGEMENT RESPONSIBILITIES

3.1. Office of the Under Secretary of Defense for Acquisition and Technology, Director, Test, Systems Engineering, and Evaluation (OUSD(A&T)/DTSE&E). DTSE&E:

3.1.1. Publishes once a year, with the Director, Operational Test and Evaluation (DOT&E), a combined list of OSD T&E oversight programs.

3.1.2. In conjunction with DOT&E, approves the TEMP for OSD oversight programs.

3.1.3. Ensures the Major Range and Test Facility Base (MRTFB) is properly configured for future systems testing.

3.1.4. Participates in integrated product teams (IPT) as required for T&E planning and execution.

3.1.5. Manages the Central Test and Evaluation Investment Program (CTEIP) and the Resource Enhancement Project (REP).

3.2. Director, Operational Test and Evaluation (OSD/DOT&E). DOT&E:

3.2.1. Prescribes OT&E and live fire test and evaluation (LFT&E) policies and procedures for DoD.

3.2.2. Exercises oversight responsibility for major defense acquisition programs (MDAP) or any other program in which the Secretary of Defense (SECDEF) or Congress have special interest.

3.2.3. Publishes once a year, in conjunction with the DTSE&E, a combined list of OSD oversight programs for DT&E, OT&E, and LFT&E.

3.2.4. Monitors and reviews all OT&E and LFT&E in the DoD.

3.2.5. In conjunction with DTSE&E, approves the TEMP for OSD oversight programs.

3.2.6. Determines the quantity of operational test articles for ACAT I programs.

3.2.7. Approves in writing the adequacy of IOT&E, QOT&E, or FOT&E plans for those programs on the OSD Oversight List prior to commencement of dedicated operational testing.

3.2.8. Participates in IPTs as required for program planning and test execution.

3.2.9. Prepares an annual report for the SECDEF and Congress summarizing the OT&E and LFT&E activities of the DoD during the fiscal year.

3.2.10. Submits a beyond LRIP report to SECDEF and Congress before the system may proceed beyond LRIP.

3.3. Chief of Staff of the Air Force (CSAF). CSAF organizes, trains, and equips personnel and provides resources for T&E throughout the Air Force. The Air Force Operational Test and Evaluation Center (AFOTEC) Commander reports directly to CSAF.

3.4. Headquarters, US Air Force Director, Test and Evaluation (HQ USAF/ TE). AF/TE will:

3.4.1. Develop and advocate overall Air Force T&E policy, and oversee the T&E process throughout the Air Force.

3.4.2. Plan and program for T&E resources, and advocate funding for the Air Force T&E budget.

3.4.3. Ensure the Air Force portion of the MRTFB is properly configured for future systems testing.

3.4.4. Review all mission need statements (MNS), program management directives (PMD), analyses of alternatives (AoA), operational requirements documents (ORD), and other T&E-related documents used by HQ USAF, field agencies, and OSD.

3.4.5. Review OT&E test concepts, test plans, and final reports (see **Table 6.1.**).

3.4.6. Set Air Force policy for joint test and evaluation (JT&E), and act as the focal point for Air Force participation in JT&E programs.

3.4.7. Review and approve TEMPs prior to Service Acquisition Executive (SAE) final approval.

3.4.8. Approve all requests to modify the provisions of this AFI for OT&E programs. This includes the approval to transfer any OT&E program from AFOTEC to a MAJCOM.

3.4.9. Participate in IPTs as required for OT&E program planning and execution.

3.4.10. Function as liaison with the other services, OSD, Congress, and oversight agencies for all T&E matters.

3.4.11. Review and approve the release of all OT&E test concept briefings or OT&E plans outside the Air Force (see **Table 6.1.**).

3.4.12. Keep the CSAF informed on the status of all Air Force T&E.

3.5. Assistant Secretary of the Air Force for Acquisition (SAF/AQ). SAF/AQ will:

3.5.1. Assign a PEM for each acquisition program.

3.5.2. List all participating T&E agencies and their responsibilities in PMDs as early as practical.

3.5.3. Act as the SAE for approving TEMPs for all ACAT I, IA, and II programs, and the OSD "oversight" programs.

3.5.4. Assign staff to participate on IPTs as required for OT&E program planning and execution.

3.5.5. Ensure program executive officers (PEO) and designated acquisition commanders (DAC) certify systems ready for dedicated OT&E according to AFMAN 63-119.

3.5.6. Ensure post-MS III FOT&E responsibilities and funding requirements are documented in the ADM.

3.6. Air Force Operational Test and Evaluation Center (AFOTEC). AFOTEC will:

3.6.1. Manage the overall Air Force OT&E program by developing detailed OT&E policy and procedures.

3.6.2. Function as the Air Force OTA for all ACAT I, IA, II, and III programs, for all Air Force programs on OSD's OT&E Oversight List, or as directed. Function as the lead OTA when designated.

3.6.3. Provide appropriate information through HQ USAF/TE to OSD for the OSD T&E oversight programs as shown in **Table 6.1.** in **Chapter 6**.

3.6.4. Review and comment on PMDs to ensure clarity of direction for testing.

3.6.5. Review and comment on MNS, ORD, the operational concept of employment, and other documents to ensure requirements are clear and testable, and the mission is adequately defined.

3.6.6. Prepare Section IV and portions of Part V of the TEMP, and coordinate on the entire TEMP. If a Single Acquisition Management Plan (SAMP) is used, prepare the OT&E portions and coordinate on all areas relevant to T&E.

3.6.7. Initiate early OT&E planning during the systems engineering development process.

3.6.8. Prepare and coordinate estimates of OT&E costs, schedules, and resources in the Test Resources Plan (TRP). Program and budget for AFOTEC-conducted OT&E.

3.6.9. Identify future required OT&E capabilities in the T&E Mission Support Plan and the Test Investment Planning Process (TIPP).

3.6.10. Determine the quantity of test articles for OT&E programs.

Assist the MAJCOM in developing clear, consistent, and testable MOEs and COIs for the AoA.

3.6.11. Develop clear and consistent MOEs and MOPs for OT&E plans.

3.6.12. Participate as early as possible in test planning working groups (TPWG) and other IPTs to help clarify system performance-based requirements, and ensure OT&E resources are available when required.

3.6.13. Promote the use of M&S as much as practical to aid in test design, augment test data, and reduce overall OT&E costs.

3.6.14. Establish criteria for determining which programs warrant AFOTEC-conducted testing. Document decisions and rationale, and forward a copy to HQ USAF/TE.

3.6.15. Participate in the certification of system readiness for dedicated OT&E according to AFMAN 63-119, and “accept” systems (or reject, as appropriate) for OT&E.

3.6.16. Conduct all IOT&Es, QOT&Es, and FOT&Es, and report results directly to the CSAF and the MDA.

3.6.17. Conduct EOAs, OAs, and OUEs as required or directed.

3.6.18. Identify, validate, report, and prioritize system deficiencies and enhancements found during OT&E according to TO 00-35D-54. For software intensive systems, also use MIL-STD-498, *Software Development and Documentation*.

3.6.19. Provide information and data about system deficiencies to the SM as soon as possible for early deficiency resolution.

3.6.20. Participate in combined DT&E/OT&E and combined test forces (CTF) to the maximum extent practical without compromising the independence of the dedicated phase of OT&E.

3.6.21. Ensure OT&E results and Lessons Learned are fed back into appropriate archives for future users.

3.6.22. Conduct FOT&E after the MS III decision as directed.

3.6.23. Assist AF/TE in the execution of JT&E programs, and act as the Air Force manager for chartered JT&Es.

3.6.24. With regard to ACTDs, assist the user-sponsor to the maximum extent possible as follows:

3.6.24.1. Assist in demonstration planning and execution by providing operational expertise, and by ensuring operational realism.

3.6.24.2. Assist in developing MOEs and measures of performance (MOP).

3.6.24.3. Assess and preserve demonstration data for future use in formal OT&E or system acquisition efforts.

3.6.24.4. Make recommendations for system improvement.

3.6.24.5. Assess the readiness of the ACTD system for transition to the formal acquisition process.

3.6.24.6. Identify strengths and weaknesses in system effectiveness and suitability.

3.6.24.7. Assist in developing the required formal documentation.

3.6.25. Support battlelab initiatives by providing demonstration, planning and execution expertise and support as requested by the battlelab commander(s).

3.7. Major Command (MAJCOM). The MAJCOMs (also called users or using commands) will:

3.7.1. Provide policy and direction to the MAJCOM test centers and squadrons, Air National Guard (ANG), and Air Force Reserve Command (AFRC). See AFI 99-150.

3.7.2. Provide up-to-date MNS, ORDs with testable parameters, and operational concepts of employment.

3.7.3. Develop AoAs or similar studies to assist in making trade-offs between cost, schedule, and performance. Among other things, the AoA will contain testable MOEs.

3.7.4. Assist the SM and OTA in developing a system maturity matrix (SMM) if interim performance values are needed before initial operational capability (IOC) is achieved; and amend the ORD and RCM to reflect these values if appropriate.

3.7.5. Use I/QOT&E, FOT&E, and FDE results to identify current system deficiencies or shortfalls in future mission capabilities in mission area plans (MAP), mission area assessments (MAA), mission needs analyses (MNA), MNS, and ORDs.

3.7.6. Participate in IPTs as required for OT&E planning and execution.

3.7.7. Make command resources available to support T&E activities, ACTDs, and BIs as agreed in the TEMP, TRP, and other test documentation.

3.8. Major Command (MAJCOM) Test Centers and Squadrons. MAJCOM test centers and squadrons will:

3.8.1. Participate as early as possible in TPWGs for developing the TEMP, OT&E plan, and other plans as required.

3.8.2. Monitor applicable DT&E, I/QOT&E, and FOT&E to prepare for subsequent MAJCOM-conducted FDE.

3.8.3. Plan, conduct, and report on all FDE, TD&E, and WSEP during the sustainment portion of the system life cycle as required.

3.8.4. Participate in AFOTEC-conducted OT&E activities and combined test forces as required or directed.

3.8.5. Plan for formal training of test personnel and their certification under the Acquisition Professional Development Program (APDP).

3.8.6. Participate in BIs and ACTDs as requested (see paragraph **3.6.25.**).

3.8.7. Participate in IPTs as required for OT&E planning and execution.

3.9. Test Planning Working Group (**TPWG).** The TPWG (also called the Test And Evaluation Integrated Product Team [T&E IPT]**)** will:

3.9.1. Develop, coordinate, and update the TEMP.

3.9.2. Participate with the OTA in setting OT&E goals, MOEs, and T&E strategies.

3.9.3. Help define OT&E organizational responsibilities and relationships.

3.9.4. Develop a realistic T&E schedule.

3.9.5. Determine required test resources and coordinate resource availability, to include necessary facility upgrades and personnel requirements. Help estimate OT&E costs.

3.9.6. Help the SM prepare and review the test portions of requests for proposal (RFP) and related contractual documents. Help evaluate contractor proposals.

3.9.7. Form subgroups such as a Computer Resources Working Group (CRWG) to address software T&E requirements.

3.9.8. Participate in the test readiness review (TRR).

3.9.9. Form a subgroup such as the Logistics Test Working Group) to address logistics T&E requirements, schedule, planning, execution, and reporting. This group will also communicate to the TPWG the logistics resources needed to support ground tests, flight tests, and logistics T&E.

3.10. Headquarters, AFMC Director of Operations (HQ AFMC/DO). AFMC/DO will:

3.10.1. Function as the Chief Operating Officer for the AFMC T&E Business Area.

3.10.2. Approve waivers for use of non-DoD test facilities.

3.10.3. Conduct long range planning to ensure adequate T&E infrastructure and processes are in place to support the T&E required to sustain current systems and to acquire future systems.

3.10.4. Support the identification of OT&E capabilities and requirements through the TIPP, and program and budget for them as necessary.

3.11. AFMC Single Manager (SM). With respect to OT&E, the SM will:

3.11.1. Chair the TPWG, and prepare and coordinate the TEMP.

3.11.2. Contract for and/or provide OT&E articles, OT&E Type 1 to 5 training, and other items as required in support of OT&E.

3.11.3. Use the MNS, ORD, and threat assessment documents to translate operational requirements into performance-based specifications and standards during each acquisition phase.

3.11.4. Ensure an approved deficiency reporting process supports the acquisition program according to TO 00-35D-54.

3.11.5. Form and chair IPTs (such as the Material Improvement Program Review Board (MIPRB) and the Joint Reliability and Maintainability Evaluation Team (JRMET)) to track and resolve deficiencies identified during DT&E and OT&E. See paragraph **7.3.**.

3.11.6. Ensure operational testers are members of the request for proposal (RFP) and source selection IPTs in order to review test-related documentation.

3.11.7. Ensure government access to contractor T&E data, deficiency reporting processes, and test results through the contract proposal process.

3.11.8. Certify systems are ready for dedicated I/QOT&E according to AFMAN 63-119.

3.12. AFMC Air Logistics Centers (ALC) and Product Centers. With respect to OT&E, each ALC and product center commander will:

3.12.1. Establish procedures for implementing the T&E process consistent with this AFI.

3.12.2. Provide OT&E support to AFOTEC, SMs, and responsible test organizations (RTO) as required in the PMD and TEMP.

3.12.3. Support FDE of fielded systems during their life cycles, as directed.

3.12.4. Participate in IPTs as required for OT&E planning and execution.

3.13. AFMC Single-Face-to-Customer (SFTC) Offices. The SFTC offices will:

3.13.1. Advise those responsible for T&E planning for new programs, major modifications, upgrades, or product improvement programs.

3.13.2. Serve as objective test consultants able to identify available resources and risks in test options (see AFI 99-109, *Test Resource Planning*).

3.13.3. Participate in improvement and modernization investment planning through the TIPP.

3.14. Developmental Test Centers. The Air Force Flight Test Center (AFFTC), Air Force Development Test Center (AFDTC), and Arnold Engineering Development Center (AEDC) will:

3.14.1. Designate Test Representatives as required as the single focal point for T&E at each of the ALCs and product centers.

3.14.2. Conduct long range planning to ensure adequate T&E infrastructure and processes are in place to support the OT&E and FDE required to sustain current systems and to acquire future systems.

3.14.3. Participate in OT&E resource investment planning processes, groups, boards, etc.

3.14.4. If designated the RTO or participating test organization (PTO), provide T&E support to AFOTEC or the OTA as required in the PMD, TEMP, and paragraph **3.13.** of this instruction.

3.14.5. Participate in TPWGs and IPTs as required for test planning and execution.

3.15. Responsible Test Organization (RTO). The RTO will:

3.15.1. Ensure sufficient DT&E data are available for combined DT&E/OT&E as agreed.

3.15.2. Integrate government and contractor, and DT&E and OT&E requirements for combined test programs.

3.15.3. Oversee OT&E safety according to AFI 91-202, *The US Air Force Mishap Prevention Program*, and AFI 31-702, *System Security Engineering*.

3.15.4. Establish procedures for analyzing hazards and risks at each level of testing so OT&E is conducted at the lowest practical risk.

3.15.5. Participate in TPWGs and other IPTs as required.

3.16. Participating Test Organization (PTO). The PTO will:

3.16.1. Participate in IPTs as required for test program planning and execution.

3.16.2. Assist the operational test agency as required.

3.17. Defense Intelligence Agency (DIA). The DIA will:

3.17.1. Provide validated and updated threat documents in support of milestone decisions.

3.17.2. Provide validated and updated threat models, and threat data for M&S tools and digital system models.

3.17.3. Participate in IPTs as required for test program planning and execution.

3.18. Joint Interoperability Test Command (JITC). JITC will:

3.18.1. Review and monitor DT&E and OT&E plans and activities for systems having compatibility, interoperability, and integration (CII) requirements.

3.18.2. Perform a two-part certification process according to Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6212.01A: certify technical compliance with system CII requirements prior to the start of OT&E; and independently certify interoperability before system deployment.

3.18.3. Certify network software and hardware components according to AFI 33-108.

3.19. Other Commands or Agencies. Participating and supporting commands support OT&E and IPTs as specified in the PMD, the TEMP, and this instruction.

Chapter 4

OT&E IN THE ACQUISITION PROCESS

4.1. OT&E Support of the Acquisition Process. The acquisition process consists of four acquisition milestones and four event-driven phases (see DoD 5000.2-R for details). The milestones are key points at which decision makers review programs and authorize advancement to the next acquisition phase. Since OT&E results greatly influence these decisions, planning the OT&E strategy must begin as early as possible to mitigate program risks. Operational testers must be prepared to tailor OT&E activities to support the chosen acquisition strategy. In all cases, OT&E will be structured to measure attainment of operational effectiveness and suitability, reduce program risks, and provide essential information to decision makers and users.

4.2. Pre-Milestone 0. The Air Force uses the MAA and MNA to identify mission needs and develop possible solutions. MAJCOM-conducted FDE also contributes valuable information for determining future requirements. Based on this knowledge, users prepare MNS if materiel solutions are warranted. Milestone 0, Approval to Conduct Concept Studies, marks the initial formal interface between the requirements generation and the acquisition systems, and sets Phase 0 in motion.

4.3. Phase 0 (Concept Exploration).

4.3.1. Planning the Test Approach. The OTA will:

4.3.1.1. Begin monitoring proposed programs as early as practical (generally after a validated MNS is issued).

4.3.1.2. Review available program documentation to determine the amount and type of OT&E needed.

4.3.1.3. Assist MAJCOMs in developing strategies-to-tasks, mission essential tasks, and testable measures of effectiveness (MOE) for the analysis of alternatives (AoA).

4.3.1.4. Assist MAJCOMs in developing MS I ORDs that contain the following: clear, testable requirements, MOEs, and measures of performance (MOP) stated in operational terms (not specifications); and workable operational concepts and employment descriptions from which realistic test scenarios can be developed.

4.3.1.5. Identify potential shortfalls in the T&E infrastructure and test resources (to include M&S requirements) needed to support proposed programs. Submit resource requirements through the SFTCs and the TIPP process.

4.3.1.6. Assist the SM, single-face-to-customer (SFTC) office, and responsible test organization (RTO) in developing the initial TEMP and an integrated T&E strategy to support the acquisition program.

4.3.1.7. Assist as required in evaluating the feasibility of alternative concepts.

4.3.2. Exiting Phase 0. Decision makers authorize the development of concept studies, if deemed necessary. A favorable MS I decision establishes a new acquisition program and authorizes entry into Phase I, Program Definition and Risk Reduction.

4.4. Phase I (Program Definition and Risk Reduction).

4.4.1. Program Initiation. During this phase the OTA will:

4.4.1.1. Continue assisting the MAJCOM refine strategies-to-tasks, mission essential tasks, operational concepts of employment, operational requirements, COIs, and the AoA, and help develop testable MOEs and MOPs.

4.4.1.2. Participate in the TPWG and other IPTs to refine the OT&E strategy and develop the OT&E test concept. Describe them in Part IV of the TEMP.

4.4.1.3. Use a combined DT&E/OT&E strategy for test execution as appropriate.

Verify, validate, accredit (VV&A), and update M&S tools and digital system models (DSM), as appropriate. (See AFI 16-1001, *Verification, Validation, and Accreditation (VV&A)*).

4.4.1.4. Identify needed test capabilities, facilities, M&S, DSMs, and resources for the proposed system, and document in the TEMP. Also identify shortfalls.

4.4.1.5. Determine the number of test articles required for OT&E programs (see Title 10 §2399(c)).

4.4.1.6. Identify risks in system design and testing, and recommend corrective actions to reduce those risks to acceptable levels.

4.4.1.7. Plan and conduct early operational assessments (EOA), operational assessments (OA), and operational utility evaluations (OUE) of prototypes, critical components, and subsystems as needed.

4.4.1.8. Identify all data elements and resources needed to support combined DT&E/OT&E.

4.4.1.9. Conduct over-the-shoulder observation and assessment of ongoing DT&E (both government and contractor) where appropriate.

4.4.2. Exiting Phase I. The OTA will report EOA, OA, or OUE results to decision makers responsible for the MS II decision, Approval to Enter Engineering and Manufacturing Development. If participating in a USAF-lead ACTD or Battlelab demonstration, report through the ACTD director or Battlelab commander.

4.5. Phase II (Engineering and Manufacturing Development).

4.5.1. Conducting Test and Evaluation. During Phase II, the OTA will:

4.5.1.1. Review ORDs to ensure they reflect the most current requirements.

4.5.1.2. Ensure clear, testable MOEs and MOPs are fully described.

4.5.1.3. Ensure mission essential tasks are consistent and MOE linkage exists between the AoA, ORD, TEMP, OT&E test concept, and OT&E plan.

4.5.1.4. Complete development of the OT&E test concept and test plan. Gain OSD/DOT&E approval (if required) as early as possible before beginning dedicated I/QOT&E.

4.5.1.5. Conduct OAs and OUEs as required to support decision makers.

4.5.1.6. Identify, track, and help resolve deficiencies using an approved deficiency reporting system. Identify enhancements.

4.5.1.7. Participate in DT&E (both government and contractor) in support of the combined DT&E/OT&E test approach. Monitor DT&E where appropriate.

4.5.1.8. Participate in the certification of readiness for dedicated OT&E according to AFMAN 63-119.

4.5.1.9. Ensure OT&E includes any required compatibility, interoperability, and integration (CII) testing.

4.5.1.10. Conduct IOT&E or QOT&E. Evaluate the system to determine operational effectiveness and suitability against operational requirements.

4.5.1.11. Assess the survivability (or lethality) of systems designed for combat.

4.5.2. Exiting Phase II. The OTA will provide OT&E results, and the RTO will provide DT&E results, to support the MS III decision, Production or Fielding/Deployment Approval. There shall normally be no more than one decision (i.e. either low-rate or full-rate) at the Defense Acquisition Board (DAB) level. Decision makers may direct the OTA to conduct FOT&E to answer specific unresolved issues or questions remaining from I/QOT&E and the acquisition of that system. Direction for FOT&E will be issued in an Acquisition Decision Memorandum (ADM). OT&E results are used to:

4.5.2.1. Determine if the system is operationally effective and suitable, meets users' operational requirements, and can perform mission essential tasks.

4.5.2.2. Verify deficiencies have been corrected and fixes incorporated as agreed.

4.5.2.3. Assess operational support plans, to include transition from contractor to government support, if appropriate.

4.5.2.4. Identify any additional operational and support problems.

4.6. Phase III (Production, Fielding/Deployment, and Operational Support).

4.6.1. Completing the Acquisition Process. After the MS III decision, specific issues or incomplete test objectives from the I/QOT&E may still need further operational test and evaluation. During this period, AFOTEC will:

4.6.1.1. Ensure FOT&E results are conveyed to the owners of M&S tools and DSMs for subsequent model updates.

4.6.1.2. Continually identify quality, performance, reliability, maintainability, and safety deficiencies.

4.6.2. Producing, Fielding, and Sustaining the System. During the sustainment portion of the system life cycle, MAJCOMs are responsible for conducting force development evaluation (FDE) to further develop doctrine, tactics, procedures, and training programs. (See paragraph **2.3.4.** and AFI 99-150, *Combat Air Forces Test and Evaluation*.) Block updates, modifications, preplanned product improvements (P3I), or upgrades may be used to extend useful military life, enhance producibility, or expand operational envelopes and capabilities. Some modifications, P3Is, upgrades, etc., are large enough to be considered new acquisition programs. In these instances, systems will re-enter the acquisition process at a milestone (e.g., MS II) commensurate with the acquisition strategy needed, and plan appropriately for I/QOT&E.

4.6.3. Exiting Phase III. The SM must ensure systems are properly stored, decommissioned, demilitarized, or disposed of at the end of their useful life.

Chapter 5

KEY DOCUMENTS AND THEIR RELEVANCE TO OT&E

5.1. Responsibilities for Documentation. Accurate, clear, consistent, and current program documents are critical to the successful conduct of OT&E. Operational testers will review the following key program documents to ensure clear and consistent links exist among them, and forward recommended changes and comments as required. The review helps ensure development programs are staying on track, and that OT&E planning, execution, and reporting fully support the acquisition strategy. Early involvement of operational testers also helps ensure users' needs are clearly articulated in testable and operationally meaningful language.

5.2. Mission Need Statement (MNS). MAJCOM personnel will prepare a MNS to identify and document mission deficiencies requiring materiel solutions. The MNS defines projected needs in generic operational terms without referring to a specific system, and forms the basis for the initial identification of OT&E critical issues. Operational testers must review and understand the mission deficiencies identified in the MNS before developing the OT&E test concept.

5.3. Analysis of Alternatives (AoA). Formerly called the cost and operational effectiveness analysis (COEA), the AoA supports milestone (MS) decision reviews by showing decision makers the relative advantages, disadvantages, and estimated costs of the alternatives under consideration. This MAJCOM-conducted analysis is mandatory for potential ACAT I programs and other ACAT levels as directed by the Service Acquisition Executive (SAE). AFOTEC will assist the MAJCOM in completing the AoA before MS I, and help update it for other milestones as required by the Milestone Decision Authority (MDA). Operational testers must participate early in AoA preparation to help ensure the following: mission essential tasks and measures of effectiveness (MOE) are linked to the MOEs used in the ORD and other program documents; MOEs are complete, testable, and support the decision maker's needs; future OT&E assets are identified; and the test strategy will support the acquisition process.

5.4. Operational Requirements Document (ORD). The ORD amplifies and refines the MNS. The MAJCOM will prepare the ORD during Phase 0, Concept Exploration, and update it prior to each milestone decision. The ORD documents how users will operate, deploy, and support a system, and provides initial guidance for all acquisition agencies. Testable MOEs from the AoA will be included in the ORD. Measures of effectiveness should be refined to a level of specificity that allows developmental and operational testing to assess system effectiveness. Requirements must be developed sufficiently early to ensure complete OT&E planning, especially for evolutionary and incremental acquisitions. Although operational testers do not set requirements, they must continually review the ORD to help ensure the following: mission essential tasks are linked to the AoA's mission essential tasks; MOEs are clear, testable, measurable, achievable, stated in performance-oriented (versus specification-like) terms, and are adequately linked to other documents; and the planned OT&E answers all COIs about system operational effectiveness and suitability.

5.5. Requirements Correlation Matrix (RCM). The RCM is a mandatory Air Force attachment to the ORD and provides an audit trail of the system's required capabilities and characteristics. It provides a summary of user needs and requirements for inclusion in the Integrated Program Summary, TEMP, and

Acquisition Program Baseline (APB), and serves as the foundation for developing the System Maturity Matrix (SMM). Key performance parameters (KPP) for the system are identified in the RCM.

5.6. Capstone Requirements Document (CRD). The CRD is an "umbrella document" linking the MNS to a family of related ORDs. It describes how a "system of systems" will interoperate to accomplish an overall mission, and may allocate requirements among those component systems. The CRD is not considered an ORD, and will not be used to develop specific OT&E plans. Individual system requirements are found in the ORDs of the component systems.

5.7. System Maturity Matrix (SMM). The SMM links user requirements and system specifications to interim test results projected to be achieved before systems reach maturity. The SMM is a management tool, not a requirements document. The ORD and RCM will remain the primary sources of requirements. See paragraph **6.17.** for more details.

5.8. Test and Evaluation Master Plan (TEMP). The TEMP integrates the acquisition strategy, funding, resources, and schedule into an overall T&E strategy. The TEMP is updated prior to major milestones, program baseline changes, or when there have been significant changes to the program. Key elements of the TEMP may be included in a Single Acquisition Management Plan (SAMP) if appropriate for the acquisition program (See paragraph **6.15.**). For multiservice or joint programs, a single integrated TEMP is required. The TEMP is no longer required once a program's development is completed and the COIs satisfactorily resolved. (See DoD 5000.2-R, Appendix III.)

5.9. Single Acquisition Management Plan (SAMP). The SAMP is a comprehensive document describing all relevant aspects of a program in support of a MS decision. The SAMP is structured to streamline the oversight and statutory requirements contained in all other management plans for all levels above the PEO or DAC. As a program management strategy document, it consolidates required documentation and is tailored for the specific needs of the program (see paragraph **6.15.**) All program stakeholders must be included in the SAMP IPT process to assist in its preparation. Operational testers must ensure the OT&E strategy is addressed. Unique program needs and sound management practices may dictate additional planning (e.g., a TEMP may still be required). A SAMP is required by SAF/AQ for all ACAT I and II programs, and is optional for ACAT III programs. See SAF/AQ's *Single Acquisition Management Plan Guide* for further guidance.

5.10. Test Resources Plan (TRP). The TRP is a planning and management document required for AFOTEC-conducted IOT&E, QOT&E, OUE, FOT&E, ACTD, and battlelab demonstrations. It is the source document for all OT&E inputs to the Air Force planning, programming, and budgeting system. The TRP also lists resources the MAJCOMs and other agencies have agreed to provide such as personnel, flying hours, equipment, range time, and funds. See paragraph **6.21.** for details.

5.11. Threat Assessments. OT&E planners will consider the threats identified in the System Threat Assessment Report (STAR) for ACAT I programs, or the System Threat Assessment (STA) for ACAT II and III programs. OT&E planners must use the most current versions of these documents when defining realistic test and threat environments. These documents are key sources for developing the TEMP.

5.12. Acquisition Decision Memorandum (ADM). The ADM documents the decisions made and exit criteria established at milestone decision reviews or in-process reviews. It specifies what must be done in

the next acquisition phase. Operational testers will be cognizant of and implement the decisions documented in the ADM. The ADM will document if FOT&E is required after MS III, the issues or questions to be answered, the funding, and the OTA.

5.13. Acquisition Program Baseline (APB). The APB documents the most important cost, schedule, and performance parameters identified in the ORD/RCM, and performance requirements for each phase of the program. It may also identify additional T&E requirements. OT&E personnel must be cognizant of the information documented in the APB because it acts as the "contract" between the SM and the MDA.

5.14. Program Management Directive (PMD). The PMD provides official Air Force direction for execution of approved and funded programs or activities. The PMD provides only top level, concise, and timely program specific direction, and does not authorize expenditure of funds. HQ USAF usually prepares the initial PMD upon MS 0 approval, after which the SM takes charge. During the PMD review cycle, AF/TEP and HQ AFOTEC review the accuracy of T&E information, including unique areas of risk, and responsibilities of all commands or agencies supporting OT&E activities. The PMD typically does the following: assigns programmatic responsibilities to implementing organizations, MAJCOMs, field agencies, and test organizations, as applicable; integrates the activities of these organizations; identifies review and approval authorities; and states unique program objectives, constraints, and thresholds. See HOI 800-2, *Policy and Guidance for Preparing Program Management Directives*, for details.

5.15. Other Formal Agreements.

5.15.1. Memorandum or Letter of Agreement or Understanding (MOA, LOA, MOU). An MOA, LOA, or MOU is used to outline tasks and responsibilities when a program introduction document (PID) is not appropriate for securing required services or resources from another agency. AFI 25-201, *Support Agreement Procedures*, gives guidance on the format and content of these documents.

5.15.2. Host-Tenant Support Agreement (HTSA). The OTA, RTO, or PTO will prepare HTSAs to delineate base support requirements, and the responsibilities of the host base and the tenant (the test team). These agreements are used when testers plan to use a non-MRTFB location which does not have an established process for granting test support. AFI 25-201 gives guidance on the format and content of these documents.

Chapter 6

OT&E PLANNING

Section 6A—Advanced Planning

6.1. Supporting the Acquisition Strategy. The OT&E strategy must fully support the overall acquisition strategy, the selected T&E strategy, and the users' mission needs. To meet demands for reduced time and cost, modified acquisition strategies such as COTS, NDI, evolutionary, and incremental acquisition are gaining increased emphasis. The user's mission, priorities, and operational requirements should be defined before developing an OT&E strategy.

6.2. Integrated Product and Process Development (IPPD). IPPD is a management technique that integrates all acquisition activities starting with requirements definition through production, fielding, deployment, and operational support. The goal is to optimize the design, manufacturing, business, and supportability processes. System managers and operational testers will apply the IPPD concept throughout the acquisition process to the maximum extent practicable. The overall performance of the acquisition system will be maximized, not just the performance of individual functional areas, by identifying problems early and maintaining a cooperative spirit of problem resolution. (See DoDD 5000.1 and DoD 5000.2-R.)

6.2.1. Integrated Product Teams (IPT). At the core of IPPD are integrated product teams (IPT). The IPT capitalizes on the strengths of all participants working as a team for the overall benefit of the program. A number of IPTs may work simultaneously on various aspects of an acquisition program. For example, the Test Planning Working Group (TPWG), or test IPT, is a specialized IPT addressing test matters and charged with developing the TEMP. Operational testers must get involved early in any IPT dealing with acquisition or test strategy planning.

6.2.2. Integrated Test Planning. The SM will begin integrated acquisition planning efforts by forming IPTs composed of all system stakeholders (contractors, subcontractors, developmental and operational testers, maintainers, depots, logisticians, users, etc.). The OTA will participate as early as feasible in acquisition strategy planning, and help develop the overarching T&E strategy. The SM and OTA will use IPTs to plan T&E efforts, and will use combined DT&E/OT&E and combined test forces (CTF) whenever practicable.

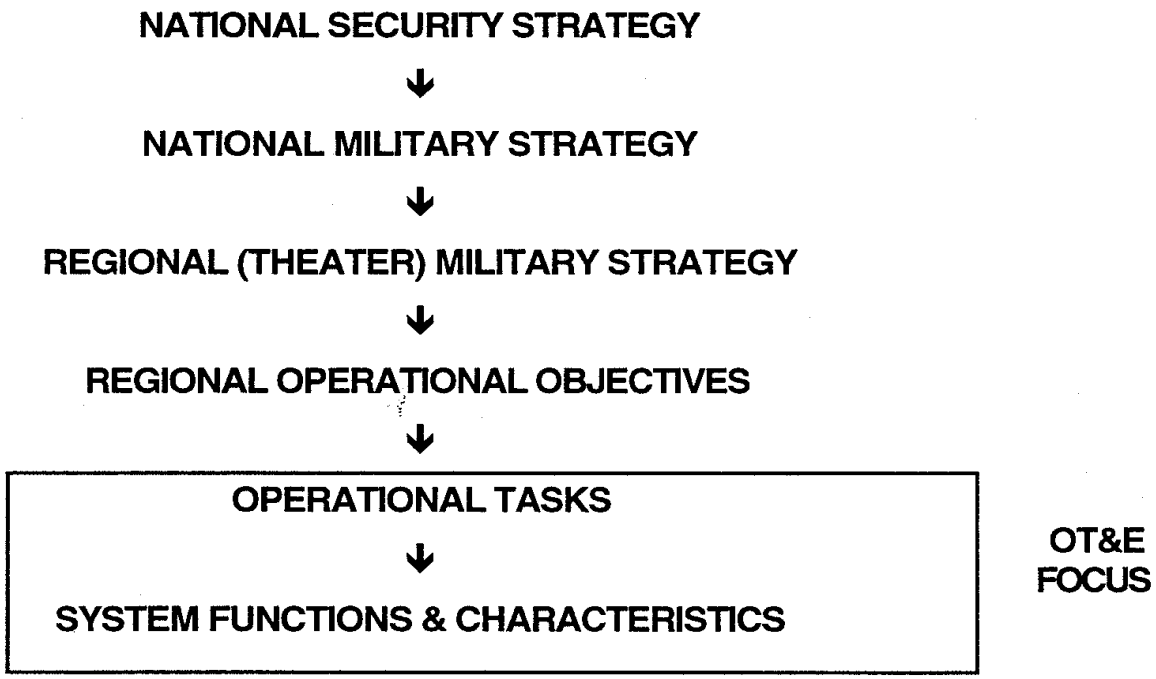
6.3. OT&E Involvement Determination . AFOTEC will systematically assess candidate acquisition programs, ACTDs, and BIs as early as possible to determine if AFOTEC's involvement will add value to these programs. AFOTEC's decision criteria, outcomes, and rationale must be documented, and a copy sent to HQ USAF/TEP. AFOTEC will plan to conduct all IOT&Es, QOT&Es, and FOT&Es unless OT&E is not warranted.

6.4. Nature of OT&E Planning. Operational testers must ensure their OT&E plans are comprehensive, efficiently structured, have a scientifically sound evaluation methodology, and are based on the system's intended mission and operational tasks. In addition, operational testers must: develop actions and rationale to be followed during the test; outline the procedures for collecting, documenting, and evaluating the data collected; identify all required resources; establish feedback loops; and accurately communicate the proposed test program to approval authorities. Evaluation methodologies must be scientifically sound.

Successful test planning culminates in an executable test plan with a complete audit trail back to the Defense Planning Guidance.

6.5. Strategies-to-Tasks. Operational testers will use the strategies-to-tasks framework shown in Figure 6.1. as a method for linking system-specific MOEs and MOPs to the Defense Planning Guidance. Working from the top down, national security strategy is supported by national military strategy, which in turn is supported by various regional, or theater-level, strategies. These strategies are supported by regional operational objectives composed of one or more operational tasks or missions. Once the user defines the operational tasks and missions, system performance parameters, system characteristics, and associated thresholds and objectives are determined and published in the ORD. Mission essential tasks must be identified as early as possible in the acquisition program. The conduct of operational testing is done primarily at the bottom two tiers of Figure 6.1. However, the final OT&E evaluation, report, and briefing must discuss the test results in terms of operational mission-level impacts and contributions at the next higher tiers, as appropriate for each program. For OT&E planning purposes, the term "operational task" is approximately equivalent to the “mission." See AFPAM 99-116 for more details.

Figure 6.1. Strategies-to-Tasks Framework.



6.6. Tailoring the OT&E Strategy. Acquisition reform and streamlining initiatives permit far greater flexibility in managing acquisition programs. Operational testers must tailor the OT&E strategy to support the selected acquisition strategy, yet still ensure operational effectiveness and suitability are rigorously evaluated. Begin tailoring the test program by downsizing the baseline (full-scale) IOT&E, QOT&E, or FOT&E effort to the proper level of effort. Risk analysis methods and DSMs can help determine the most cost-effective and efficient test structure while ensuring sufficiently robust evaluations. Testers will not substitute OAs or OUEs without careful consideration of risk. A key principle is the amount of OT&E should be directly proportional to the level of risk. Some examples where tailoring is used are:

6.6.1. Commercial-off-the shelf (COTS) or nondevelopmental items (NDI). See paragraph **6.9.**

6.6.2. Systems using incremental or evolutionary acquisition strategies. See paragraphs **6.10.** and **6.11.**

6.6.3. One-of-a-kind systems where decisions to buy must precede the completion of OT&E.

6.6.4. Systems requiring operational evaluation of nonproduction representative articles or prototypes.

6.6.5. Systems that must maintain an on-line operational status while being tested.

6.6.6. Systems operated and/or maintained by contractors.

6.6.7. Systems using modeling and simulation to fill voids caused by high cost or nonavailability of test resources.

6.6.8. Advanced concept technology demonstrations (ACTD) and battlelab initiatives (BI).

6.6.9. Critical systems described in a Combat MNS which require fielding in minimum time. See AFI 63-114, *Rapid Response Process*, for details.

6.7. Combined DT&E and OT&E. A combined DT&E/OT&E approach and combined test force (CTF) organizational structure will be used to the maximum extent possible. Because the resources, test events, and data for DT&E and OT&E are often similar, developmental and operational testers are able to integrate their testing efforts to improve overall test efficiency. However, the combined test approach must not compromise either developmental or operational test objectives. A final phase of dedicated I/QOT&E will be required for beyond LRIP decisions. The combined DT&E/OT&E strategy will be described in the TEMP.

6.7.1. Combined Test Forces (CTF). Formation of a CTF will be directed in program documentation or in detailed memorandums of agreement. The CTF's charter will build early and complete integration of operational users, system and support contractors, developmental testers, and operational testers into a smooth continuum of test efforts. All test organizations participating in the CTF will make resources available under a unified command structure at a single location, or as determined to be the most efficient organization. The CTF structure will be described in the TEMP.

6.7.2. Order of Combined Testing. The SM will generally conduct DT&E first to answer critical technical or engineering questions, and determine or verify the system's performance envelope. DT&E information may come from contractor-conducted and/or government-conducted tests. OT&E personnel will participate in DT&E as early as possible to familiarize themselves with the system, and to review test data as early as possible. As DT&E progresses, more DT&E and OT&E events and data requirements will be combined where possible. Operational testers may also use operational assessments (OA) and operational utility evaluations (OUE) as necessary.

6.7.3. Responsibility for Combined Test Results. The RTO is ultimately responsible for achieving DT&E objectives. AFOTEC or the designated OT&E agent is responsible for achieving OT&E objectives, and for evaluating and reporting results independently. The SM, RTO, and OTA must play active roles in test planning, contract reviews, test execution, and test oversight to ensure the validity of contractor DT&E data.

6.8. Contractor Involvement in OT&E. Congressional statute (Title 10 §2399) and DoD 5000.2-R place strict limits on contractor involvement in OT&E. Because the amount of contractor-conducted DT&E is increasing, operational testers must be thoroughly prepared to deal with contractor involvement pitfalls as well as opportunities.

6.8.1. System Contractors. Operational testers must strictly avoid situations where prime or system contractors who build the system could improperly influence OT&E results, or compromise the realistic accomplishment of OT&E scenarios. (However, limited system contractor involvement in OT&E is permitted if the operational concept of employment requires the contractor to be involved in the operation, maintenance, and support of the system when the system is deployed.) Operational testers, the SM, and RTO must ensure the quality and integrity of any system contractor data used for the combined portions of DT&E/OT&E. The data must be accurate, objective, reliable, and available for independent evaluation. Any use of system contractor data in OT&E must be described in the TEMP.

6.8.2. Support Contractors. Title 10 §2399(e) also places limitations on the involvement of support or service contractors in OT&E. Under no circumstances may support contractors be involved in the establishment of criteria for data collection, performance assessment, or evaluation activities for the OT&E. However, support contractors may be used to collect and manage data in support of OT&E. Support contractors working solely for the government (e.g., working for the SPO on the same program) may also participate in OT&E.

6.8.3. Government Reliance on Contractors. The greater the reliance on contractors for combined test data, the greater the need for oversight by knowledgeable government officials. See OMB Policy Letter 92-1, *Inherently Governmental Functions*, for guidance about which functions must be retained by the government.

6.8.4. Early Involvement With System Contractors. Operational testers may need to work side-by-side with system contractors in the early phases of programs. Activities such as ACTDs, BIs, EOAs, and OUEs may be conducted, but will not be used as substitutes for I/QOT&E. The operational tester's primary functions in these activities are to support the "user-sponsor" with cost effective and timely assistance, and to assess the system's military capabilities and limitations. Collection of data for future OA or OT&E efforts is a secondary consideration, and the prohibitions in Title 10 §2399 may not apply. Contact AF/TEP if questions arise.

6.9. Commercial Systems. When commercial systems (also called commercial and nondevelopmental items, or CaNDI) are modified or adapted for military use, they must be operationally tested against user requirements. Operational testing (e.g., QOT&E) will be conducted on the military-unique aspects of COTS and NDI systems. Such testing should use the findings from commercial testing and experience to augment OT&E results. This testing often supports evolutionary and incremental acquisition strategies.

6.10. Incremental Acquisition Systems. The first fielded increment should provide "core" functionality. OT&E will be tailored to test only the current increment's functionality, while future increments will be tested just before implementation. Generally, only one increment will be tested at a time, with AFOTEC conducting IOT&E of the first (or core) increment. AFOTEC will perform a risk assessment to determine how to tailor future OT&E activities. Operational assessments and OUEs may be used to supplement OT&E of subsequent increments (see paragraph **2.3.**). When the preponderance of operational requirements for the system have been met or the risks associated with follow-on increments are judged

to be sufficiently low, the OTA, with HQ USAF/TE coordination, may transfer T&E responsibilities to a MAJCOM organization. AFOTEC, in conjunction with the user and the SM, will develop criteria for transitioning test responsibilities to the MAJCOM test agency. AFOTEC may later resume its lead role if subsequent risk assessments show elevated risks which warrant AFOTEC reinvolvement.

6.11. Evolutionary Acquisition Systems. Same as paragraph **6.10.**, with the exception that results of testing will be used to provide feedback to the user and developer to refine requirements for future increments.

6.12. Multiservice Operational Test and Evaluation (MOT&E). When the Air Force is the lead service, all service-unique test requirements will be incorporated as much as possible into a single, multiservice test plan. A single integrated TEMP is also required. The supporting services or agencies may develop their own OT&E plans to satisfy individual service requirements. If separate service plans are required, they will be included as attachments to the multiservice plan. When the Air Force is not the lead service, ensure all Air Force-unique test requirements are incorporated into the single, multiservice plan. For more details, see the *Memorandum of Agreement on Multiservice Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation (JT&E).*

6.13. Compatibility, Interoperability, and Integration (CII) Testing. Operational testers will ensure sufficient CII testing is accomplished for systems with CII requirements. The OTA will coordinate with the Air Force Information Warfare Center (AFIWC) for CII testing of system security requirements. The OTA will also ensure planned OT&E activities support the Joint Interoperability Test Command's (JITC) certification activities, there is minimal CII test duplication, and CII data is accurately and completely collected. If done completely and correctly, no additional testing by the certifying authority should be needed. For details, see Joint Chiefs of Staff Instruction (CJCSI) 6212.01A, *Compatibility, Interoperability, and Integration of Command, Control, Communications, Computers, and Intelligence Systems.* For CII certification of network software and hardware components, see AFI 33-108, *Compatibility, Interoperability, and Integration of Command, Control, Communications, Computer (C4) Systems*.

6.14. Sources of Information. Numerous sources of information are available to assist OT&E planners. Some examples are:

6.14.1. Single-Face-To-Customer (SFTC) Offices. The SFTC offices will provide early OT&E programmatic and investment planning services. The SFTC offices also identify risks in the available test options, prioritize and advocate for test resources, and help customers understand the capabilities, limitations, and applications of test resources. Three SFTC offices support the test process. The Aircraft-Propulsion-Avionics/Electronic Warfare (APA/EW) SFTC is located at Edwards AFB, phone (805) 275-9250 or DSN 525-9250. The Armament/Weapons-C^4I SFTC is located at Eglin AFB. For A/W, call (850) 882-3316 or DSN 872-3316. For C^4I, call (850) 882-9650 or DSN 872-9650. The Space SFTC is located at Kirtland AFB, phone (505) 846-6080 or DSN 246-6080.

6.14.2. DoD Acquisition Deskbook. The Deskbook contains all the non-directive material, descriptive information, and discretionary practices that were removed from DoD 5000.2-R. The Deskbook identifies and benchmarks the core processes of acquisition management, communicates best practices, and describes the entire "cradle-to-grave" acquisition process, among other things. The Deskbook also contains Air Force instructions and the Air Force Lessons Learned Database which stores

technical and management lessons learned in the acquisition community. The Deskbook website is www.deskbook.osd.mil.

6.14.3. OT&E Lessons Learned Program. HQ AFOTEC's Policy and Procedures Division (AFOTEC/XPY, DSN 246-5242) manages the OT&E Lessons Learned Program. An abstract listing of all OT&E Lessons Learned is available upon request.

Section 6B—Developing Test Plans

6.15. Test and Evaluation Master Plan (TEMP). The OTA and TPWG will document the overarching test strategy in the TEMP. The TEMP requires HQ USAF/TE, SAF/AQ, and OSD review and approval if the program is ACAT I or on the OSD oversight list. OT&E must not start until the TEMP is approved (see paragraph **6.19.1.**). Multiservice and joint programs require multiple service approval of a single, integrated TEMP.

6.15.1. TEMP Contents. The TEMP must fully integrate the OT&E strategy, test and evaluation concept, schedule, funding, and associated documentation with the overall acquisition strategy. The TEMP provides linkage between operational requirements, system characteristics, key parameters (performance, cost, and schedule), MOEs used in OT&E, and how these elements support the mission or task the system is to perform. In addition, the TEMP must document the following specific areas: how MOEs and MOPs will be addressed during OT&E; OTA responsibilities and key organizational relationships; how and when a combined DT&E/OT&E approach will be used if time and cost savings warrant; all test resources (funding, M&S, facilities, personnel, test articles, etc.); and the impacts of test and resource limitations. See DoD 5000.2-R, Appendix III, for details about content and format, and AFI 99-101, paragraph 6.12.

6.15.2. TEMP Preparation. Operational testers will assist the SM in developing and updating the TEMP, as required. The initial TEMP must be as specific as possible in addressing the T&E strategies, with follow-on TEMPs providing more details on the T&E strategies as the system matures. The SM will use an IPT approach (e.g., a TPWG) which includes DTSE&E and DOT&E representatives, if appropriate. The OTA is responsible for writing Part IV (the OT&E section) and developing the OT&E resources portion in Part V of the TEMP. No areas will remain "to be determined" (TBD) past MS II. The completed TEMP represents agreement among all TPWG participants.

6.15.3. Incorporation of the TEMP into a SAMP. Key elements of the TEMP may be incorporated into a SAMP at the discretion of the SM, and with the concurrence of the TPWG and MDA. A separate TEMP may not be required if the SAMP is complete and adequately addresses the needs of the T&E community and senior decision makers according to SAF/AQ's *SAMP Guidance*. However, the TEMP will remain the primary T&E management document if program risks are high, or senior decision makers require the document.

6.15.4. OSD/DOT&E SAMP Requirements . OSD/DOT&E clarified the relationship between TEMPs and SAMPs for programs under their oversight. For all ACAT I and IA programs, and other acquisition programs designated for OSD T&E oversight, the Air Force will meet TEMP requirements stated in DoD 5000.2-R in one of three ways: include the mandatory TEMP format and content in the body of the SAMP; include the entire TEMP and signature page as an annex to the SAMP; or develop a stand-alone TEMP. In any case, OSD will retain signature approval authority of all TEMP contents as mandated by DoD 5000.2-R.

6.15.5. SAMP T&E Contents. The SAMP must capture all T&E strategies and requirements necessary for T&E program execution. As a minimum, it must cover Parts II, III, IV, and V of the TEMP when addressing T&E matters. All TPWG stakeholders will be included in the SAMP IPT when preparing the T&E portions of the SAMP. The OTA will write the OT&E portions of the SAMP. More details are contained in the *Single Acquisition Management Plan Guide,* 29 Apr 96, available from SAF/AQXA.

6.15.6. Automated Test Planning System (ATPS). ATPS provides structured and systematic methods for TEMP preparation, review, and program risk assessment. It improves TEMP consistency, quality, and efficiency, and helps reduce the learning curve for less experienced testers. Copies of this personal computer-based expert system can be obtained from OUSD(A&T)/DTSE&E at DSN 225-7246.

6.15.7. Service Coordination. The SM will submit the TEMP "in parallel" to all organizations represented on the TPWG. Organizations are normally allowed 30 days for coordination, and TEMP due dates are firm (see **Table 6.1.**). Organizations will not withhold TEMP coordination or approval in an attempt to resolve issues or force solutions. If issues remain unresolved for more than 30 days, the dissenting organization must provide a position statement or a formal nonconcurrence. When the TEMP cannot be submitted on time, the SM must write to the appropriate Air Force approval authority stating the reason for the delay and commit to a new submittal date.

6.15.8. Required SAMP Signatures. In most cases, final approval authority for the SAMP is the Milestone Decision Authority (MDA). If the TEMP is incorporated into the SAMP, additional approval signatures are required from AFOTEC/CC and HQ USAF/TE. For oversight programs, DOT&E and DTSE&E are also required. Test community approval of the SAMP represents approval for only the test portions of that document.

6.15.9. Initial TEMP Submission. SMs will submit initial TEMPs via the PEM to the PEO or DAC, and the Mission Area Director (MAD). The MAD will coordinate the TEMP through HQ USAF/TE, and submit it to the Service Acquisition Executive (SAF/AQ) for service approval.

6.15.10. Service-Level Approval. Service approval consists of AF/TE and Air Force SAE signatures. For multiservice programs, signatures from the other participating SAEs are also required. TEMP approval authorities will not approve TEMPs without a current MNS, STAR or STA, and ORD. Some TEMPs require additional OSD approval (see paragraph **6.20.** on OSD Oversight Requirements).

6.15.11. TEMP Updates and Changes. After initial submission, the SM revises the TEMP to support milestones, or to reflect significant changes or breaches in the program. OTAs will continue developing Section IV in support of the SM's TEMP review cycle. Updates or changes will be submitted to the SM through the TPWG, as appropriate.

6.16. Test Planning Working Group (TPWG). The TPWG (also called the T&E IPT) is mandatory for major defense acquisition programs (MDAP or ACAT I) and OSD OT&E oversight programs, and is highly recommended for all others The TPWG will include representatives from each organization involved in the test program. All TPWG members must work together as a cross-functional team. The OTA representative must be empowered to make decisions for the OTA, be highly knowledgeable in the discipline of operational testing, and provide full support in the development and coordination of the TEMP. See AFI 99-101, Chapter 6, for more information about TEMPs and TPWGs.

6.17. Using the System Maturity Matrix (SMM). The SMM is especially useful for highly complex systems which will be tested and fielded in increments of increasing capability. The TPWG, operational testers, and users will assist the SM in developing an SMM when interim user requirements are not available in the ORD but needed for IOT&E. For critical areas, the user must determine through credible analysis if SMM values can be used in lieu of interim requirements. Operational testers will not convert SMM values into interim requirements without the active participation and consent of the user. Operational test personnel will use the SMM to help predict system performance against analytically derived interim values, APB exit criteria, or other event milestones. During testing, use the SMM to track and report actual progress toward demonstration of required system performance.

6.18. Developing and Publishing the OT&E Plan. Operational testers will develop OT&E plans which translate the test concept into well-defined test goals, resources, and schedules. The recommended contents of an OT&E plan are in **Attachment 2**. These plans will describe test events and scenarios, assign responsibilities, and describe which T&E methodologies answer the COIs, MOEs, and MOPs, and mission essential tasks. OT&E plans will fully describe how and when test information and results are reported to senior Air Force leadership. In particular, significant test event reports are required within 24 hours (see paragraphs **8.2.** to **8.7.**). Significant test events will be defined and listed in the OT&E plan and the TEMP. The test director (TD) or test manager (TM), as appropriate, is responsible for developing, publishing, and distributing the test plan. As a minimum, test plans must be approved by the commander of the test organization, or as delegated in writing. OSD oversight programs require additional approval (seeTable 6.1).

6.18.1. Early Provision of Plans. Draft OT&E concepts should normally be provided to the SM at least one year prior to start of OT&E. The SM needs the plans to accomplish more operationally relevant DT&E. Final OT&E plans should be provided to the certifying official (e.g., the PEO or DAC) a minimum of 60 days prior to certification of readiness for dedicated OT&E. Final test plan distribution will be made to all organizations involved in the test, to include two copies for the Defense Technical Information Center (DTIC).

6.18.2. MAJCOM Responsibilities. MAJCOMs are responsible for planning and conducting all force development evaluation (FDE) during the sustainment portion of the system life cycle after I/QOT&E and FOT&E are finished.

6.19. OSD Oversight Requirements . OSD publishes an annual Test and Evaluation (T&E) Oversight List of major defense acquisition programs and other programs for T&E oversight. AFOTEC will conduct the IOT&E or QOT&E for programs on the OT&E portion of OSD's Oversight List. These programs require additional briefings and supporting documentation, and have additional review and approval requirements as shown in **Table 6.1.** Action officers in HQ USAF/TEP will assist with the review, coordination, and submission of the information in **Table 6.1.** See DoD 5000.2-R and AFPAM 99-116 for details.

Table 6.1. OSD Oversight Information Requirements.

Item of Information	Hq USAF OPRs	Due to OSD[2]	Comments
TEMP[1] a. Draft TEMP b. Service-approved TEMP c. Newly-designated TEMP	OPR: PEM	a. 90 days pror to MS b. 45 days prior to MS[3] c. 90 days after program designation	DOT&E and DTSE&E approval required prior to start of system I/QOT&E. Updates required for significant changes between MSs.
Operational Assessment (OA)	AF/TEP	As agreed.	
I/QOT&E or FOT&E Plan Test Concept Briefing	AF/TEP	120 days prior to start of I/QOT&E or FOT&E	
I/QOT&E or FOT&E Plan (Service-approved)	AF/TEP	60 days pror to start of dedicated I/QOT&E or FOT&E	DOT&E approval required before I/QOT&E or FOT&E may start. Report major revisions to DOT&E.
Synopsis Report of EW Programs	AF/TEP	Due annually by 15 Nov to OSD/DTSE&E	Congressionally required[6]
Significant Test Event Reports	a. PEM for DT&E b. AF/TEP for OT&E	24 hours after event	Events and addressees are identified in the TEMP.
End of Phase T&E Report[4]	a. PEM for DT&E b. AF/TEP for OT&E	45 days prior to MS	For extended test phases, annual interim reports are required as defined in the TEMP.
I/QOT&E or FOT&E Final Report	AF/TEP	60 days after end of least test event[5]	A single report is required for joint or multi-serivce programs

NOTES:

1. Also applies to the SAMP if there is significant T&E information. Only the T&E portions of the SAMP require AF/TE, DTSE&E, and DOT&E approval.

2. All days are "calendar" days. Time periods listed are document due dates to OSD. Due dates to HQ USAF are 30 working days prior to OSD milestone (MS) review dates.

3. DoD 5000-2 requires 30 days.

4. A briefing and message are required.

5. For multi-service and joint programs, the report is due 90 days after the last test event.

6. P.L. 103-160 §220 requires SECDEF to provide specific information on the testing of electronic combat systems to Congress on an annual basis. Only EW systems on OSD T&E Oversight are affected.

6.19.1. TEMP Submission Requirements to OSD. TEMPs for OSD oversight programs require OSD/DOT&E and OUSD(A&T)/DTSE&E final approval. SMs must submit draft TEMPs to the PEM a minimum of 45 days prior to the due date at OSD (e.g., 90 days prior to the MS review) for internal Air Force review, incorporation of comments, and service approval. After service approval, the TEMP must be submitted for OSD final approval not later than 45 days (DoD 5000.2-R says 30 days) prior to each MS review (excluding MS 0), unless the IPT agrees otherwise. When a new program is added to the OSD OT&E Oversight List, a service-approved TEMP will be submitted to OSD within 90 days after OSD designation. See **Table 6.1.**

6.19.2. Briefings to OSD/DOT&E. For each OSD oversight program, AFOTEC will brief the OT&E concept to OSD/DOT&E. Briefings on the test plan, final report, and other information may also be required. A prebrief to AF/TE is required before any briefing to DOT&E. Ensure sufficient time is allowed to resolve issues after briefing AF/TE and before going to OSD. Additional briefings may be required for specific aspects of the program such as operational assessments.

6.19.3. OT&E Concept Briefing. The OT&E concept is a road map which identifies assumptions, rationale, test structure (COIs, MOE, and MOPs), timelines, and resources to provide efficient and effective OT&E information. The OT&E concept briefing is required prior to submitting the OT&E plan to DOT&E. AFOTEC will brief the test concept a minimum of 120 days prior to commencement of dedicated OT&E. If the test concept includes combined DT&E/OT&E, the briefing must review how DT&E data will be used. AF/TE must preview all test concept briefings prior to presentation to DOT&E.

6.19.4. OT&E Test Plan. AFOTEC will submit the OT&E plan to OSD/DOT&E a minimum of 60 days prior to commencement of dedicated OT&E. If the test plan includes combined DT&E/OT&E events, it must review how DT&E data will be collected and used in the evaluation. (See **Attachment 2**.) The plan must first be briefed and submitted to HQ USAF/TE a minimum of 15 days before it is due to DOT&E. Testing will not begin until DOT&E approves the adequacy of the plan in writing.

6.19.5. Electronic Warfare (EW) Programs. All EW programs on the OSD T&E Oversight List are required to annually report their progress in implementing the DoD T&E Process for EW Systems. Single managers of these programs will provide information to AF/TEP (see **Table 6.1.**). AF/TEP will consolidate information before submitting to OSD/DTSE&E.

Section 6C—Test Resources

6.20. Test Resource Acquisition Process. Operational testers must begin planning for OT&E resources and identify them in the TRP and TEMP as early as possible. Identify funded versus unfunded requirements in the TRP. All unfunded requirements must be shown as either disconnects or initiatives for the POM cycle. The PEOs and HQ USAF/TER provide guidance and management of test resource acquisition. Accurate and early resource identification, programming, budgeting, and appropriation are critical. Highly specialized resources (e.g., threat simulators, M&S tools, or advanced instrumentation) and test articles may require many years of lead-time. The SFTCs, the Test Investment Planning Process (TIPP), the Central Test and Evaluation Investment Program (CTEIP), and the Resource Enhancement Project (REP) facilitate the acquisition of test resources. See AFI 99-109, *Test Resources Planning*, for more information.

6.21. Test Resources Plan (TRP). AFOTEC will prepare a TRP for AFOTEC-conducted tests. The TRP identifies resources required to support testing, and forms the basis for AFOTEC's budget submissions, manpower plans, and procurement lead times. If a resource is not specified in the TRP, it likely will not be planned or programmed for test. The TRP should be revised as soon as program and test schedules change since it influences the DoD POM process. Test resource shortfalls will be submitted through the TIPP process described in AFI 99-109. All agencies supporting the OT&E must coordinate on the TRP.

6.22. Quantity of Articles Required for Operational Testing. The OTA commander determines the quantity of articles needed for all OT&E programs. (See Title 10 §2399(c) for details.) This determination will be forwarded to OSD/DOT&E during the test concept briefing or with the OT&E plan. All recommendations will be supported by thorough analysis of test requirements. Production representative test articles should come from LRIP which is limited by Title 10 §2400.

6.23. Budgeting for OT&E. The OTA will identify and the SM will budget for IOT&E test articles and Type 1 training. OT&E may be funded with three types of appropriations depending on the type of test required. The SM will add program-specific test resources not available, funded, or programmed to the program baseline, and include them in the resource section of the TEMP. For details, see AFI 65-601, Vol 1, *Budget Guidance and Procedures,* DoD Regulation 7000.14-R, Vol 2A, *Financial Management Regulation*, and AFI 99-109, *Test Resource Planning*. HQ USAF/TER can provide additional assistance at DSN 227-1165.

6.23.1. AFOTEC-Conducted Activities. AFOTEC will program and budget for operational testing through the TRP and POM processes. Requested funding is dependent on the nature and objectives of the testing required. For IOT&E and FOT&E, AFOTEC will program and budget RDT&E (3600), Operations and Maintenance (O&M) (3400), and Procurement (e.g., 3010, 3020, or 3080) funds as necessary. For QOT&E, AFOTEC will program and budget O&M and Procurement funds. ACTDs are usually included in 3600 funds for AFOTEC; battlelab activities are included in O&M funds; and JT&E activities are OSD-funded.

6.23.2. Deferred Tests. If a test program is considered for hand-off to a MAJCOM, justification must be sent to HQ USAF/TE and a waiver obtained first. AFOTEC will not defer any OT&E to a MAJCOM without first programming sufficiently in advance the necessary funds needed to support those deferred tests. Tests may only be deferred with fully funded support. Funding needs must be submitted sufficiently early to meet budget submission dates prior to the fiscal year required for testing. In these cases, MAJCOMs will be notified a minimum of 18 months prior to programmed test start date, and MAJCOM acceptance of test obtained.

6.23.3. MAJCOM-Conducted Force Development Evaluation (FDE). MAJCOMs will program and budget O&M (3400) or Procurement (e.g., 3010, 3020, or 3080) funds, as appropriate, for FDE. RDT&E funds will be requested and used if appropriate and available. Requests for O&M and/or Procurement funding must be submitted sufficiently early to the MAJCOM budget offices for disposition.

6.23.4. Using Foreign Materiel. If foreign materiel is required for OT&E, the OTA will comply with the foreign materiel requirements outlined in AFI 99-114, *Foreign Material Program*. AFI 99-109 provides further guidance.

6.24. Use of Government Test Facilities. Testing shall be planned and conducted to take full advantage of existing investments in DoD ranges, facilities, and other resources, wherever practical, unless otherwise justified in the TEMP. Operational testers will plan to use Air Force test facilities first, followed by DoD Major Range and Test Facility Base (MRTFB) facilities, followed last by non-DoD government facilities, to the maximum extent possible within OT&E program cost and schedule constraints.

6.24.1. Use of DoD Facilities. Operational testers will use the Air Force Priority and Precedence Rating System described in AFI 16-301, *US Air Force Priority System for Resources Management*, as a guide for scheduling MRTFB resources. The test team must file a Program Introduction Document (PID) to request test support from MRTFB facilities. The SFTC offices and test centers will provide operational testers with information and assistance on using the MRTFB and other government test facilities. Use of the MRTFB is described in DoDD 3200.11, *The Major Range and Test Facility Base.*

6.24.2. Use of Non-DoD Facilities. The mose efficient and effective test facilities will be used. Contractor facilities may be considered if DoD facilities are not available, not able to be modified for program needs, or are too expensive to duplicate. If the acquisition and test strategies plan for testing at non-DoD facilities, the SM must include these requirements in the request for proposal (RFP), and justify in the TEMP why these facilities are required. Operational testers must make special provisions to protect any data needed for combined DT&E/OT&E from potential compromise.

6.25. Use of Modeling and Simulation (M&S). Operational testers will use DSMs and M&S to the maximum extent practical for planning and data evaluation to augment, extend, or enhance field test results. Operational testers will take full advantage of DSM capabilities developed during Phase I and II to reduce OT&E costs, scope, and schedule. **Figure 1.2.** shows a hierarchy of T&E capabilities, facilities, and instrumentation which operational testers must consider for use. To the greatest extent possible, operational testers will use the J-MASS threat models developed by the intelligence agencies, and the J-MASS DSMs developed by the SPO. DSM applications will be described in the test concept, and DSM resources required for OT&E will be described in the TEMP, to include their accreditation approaches. However, OT&E will not be based solely on computer modeling, simulation, or an analysis of system requirements, engineering proposals, design specifications, or any other information contained in program documents (see Title 10 §2399(h)). Operational testers will recommend updates to the DSM configuration control manager at the conclusion of OT&E to reflect current capabilities. See AFI 14-206, *Modeling and Simulation*, and AFI 16-1001, *Verification, Validation and Accreditation (VV&A*), for details.

6.26. Augmenting Test Personnel . AFOTEC will support test teams with a cadre of AFOTEC personnel augmented by representative operating and supporting command personnel. AFOTEC will be authorized augmented personnel positions to support testing for a predetermined period of time. Augmented personnel will revert to the operating and supporting commands at the expiration of the agreed time period. The number of augmented personnel authorized and the time frame for their transfer will be determined during the TPWG process with the concurrence of AFOTEC, the operating command(s), and the supporting command(s). Test team members must have skill levels representative of personnel expected to operate and maintain the system. MAJCOMs are responsible for budgeting for these positions. All agreements will be documented in the TRP and the TEMP.

Section 6D—Additional Planning Considerations

6.27. Protecting Critical Information. Operational testers will plan and provide for the protection of classified and sensitive unclassified information, including information communicated electronically. Radiation or emissions from test instrumentation must be protected within the guidelines of the security classification guide, and international treaties or agreements. Telemetry and encryption requirements will be considered. Programs involving critical technologies or war fighting capabilities will have an approved program protection plan in place before testing begins. The test director will ensure agreements are in place for releasing sensitive OT&E data, to include information about DRs, to the SM and the MAJCOM before dedicated OT&E begins.

6.28. Reviewing Special Contract Clauses in the Request for Proposal (RFP). Operational testers will review the RFP, particularly Section H, to ensure it contains any special clauses necessary for executing the OT&E test concept and plan. Operational testers must also review Section L to ensure test program requirements are properly addressed. If the T&E concept requires a combined DT&E/OT&E approach, provisions must be included for protecting the quality and integrity of contractor test data for later use during dedicated IOT&E (see paragraphs **6.7.** and **6.8.**).

6.29. Certification of Readiness for Dedicated OT&E. Operational testers will participate in the certification process described in AFMAN 63-119 by preparing for OT&E, assisting the SM, and carrying out responsibilities as agreed. Throughout Phase II, demonstrated system performance will be compared to required system capabilities, and available test resources compared to required test resources. Identified shortfalls will be remedied before OT&E starts, or negotiated workaround plans and solutions developed. When the certification official gives final written confirmation of system readiness, the OTA commander (or designated representative) will acknowledge by "accepting" the system (or "not accepting," as appropriate) before commencing dedicated OT&E. The acceptance message officially confirms OTA agreement (or disagreement) with the certifying official's assessments and conclusions.

6.30. The Deficiency Reporting (DR) System. A major function of OT&E is to identify and report deficiencies and propose enhancements to systems undergoing test. Operational testers will be prepared to identify and help track system deficiencies and enhancements as early as possible and on a continuing basis. The SM is responsible for establishing a DR system for the program, and for determining procedures for submitting DRs. The OT&E TD will act as the screening point for validating all DRs submitted by the OT&E team. The TD will supply all available data to assist the SM in analyzing and fixing DRs. The TD must clearly distinguish between DRs for system deficiencies versus "nice-to-have" enhancements going beyond the scope of the system's basic requirements. Use the guidance in TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*. For software intensive systems, use MIL-STD-498, *Software Development and Documentation*. See AFI 99-101, paragraphs 2.18 and 7.5, and paragraph **7.3.** of this AFI, for more details.

6.30.1. Prioritizing Deficiency Reports. The operational test team, in conjunction with the user, will prioritize all open DRs for the program office at the end of OT&E. Prioritization informs the SM and decision makers about which DRs should receive the greatest emphasis. All Category I DRs and the top 10 Category II DRs will be listed in the final OT&E report and final OT&E briefing. After OT&E is complete, the operating commands will continue tracking and prioritizing all active DRs.

6.30.2. Closing Deficiency Reports. Operational testers will participate in all IPTs (such as the Joint Reliability and Maintainability Evaluation Team [JRMET]) where DRs are discussed for possible

closing actions. Deficiency reports will not be closed without the concurrence of the operational TD and the user.

6.31. Technical, Environmental, and Safety Reviews. Operational test plans and mission scenarios are subject to separate technical, environmental and safety reviews by independent government test personnel. These reviews assess whether operational test plans have adequately identified all technical, environmental, and safety hazards, and whether adequate plans exist to eliminate or mitigate risks. Operational testers will work with RTOs to set up procedures for controlling and supervising tests consistent with the risk involved and according to local range safety criteria. Operational test plans will be submitted for required reviews at each test site or facility. The Nonnuclear Munitions Safety Board (NNMSB) will review all newly developed munition items prior to live airborne testing of uncertified munitions and initiating devices, including explosive devices such as initiators and fuzes. AFI 91-205 discusses the NNMSB.

Chapter 7

CONDUCTING AND ANALYZING TESTS

7.1. Execution of Operational Test and Evaluation. Operational testers will use the scientific method and the test process to determine system operational effectiveness and operational suitability. Test scenarios will be conducted under operationally realistic and progressively more strenuous conditions. Test results will be matched against pretest predictions, and models modified prior to future tests. System deficiencies and enhancements will be identified, and deficiency reports submitted and tracked.

7.2. Test Team Training.

7.2.1. Formal Training. Operational test personnel will receive formal training in the general principles and policies of operational testing. AFOTEC/HRT operates a formal OT&E training course for new personnel. Call DSN 246-8098 to schedule the course.

7.2.2. System Training. All operational test team members must be knowledgeable about the operations and maintenance of the system under test. The developing agency will work with operational testers to provide or contract for any required operator and maintainer training (Types 1 through Type 5). Training must be completed sufficiently early to enable operational testers to act as qualified observers of key test events preceding dedicated OT&E, and to hone needed skills for operating and maintaining the system. Refresher training may be required just prior to initiating active testing.

7.3. Managing Data During Test Conduct. Operational testers will establish rigorous data control and accountability procedures. The entire OT&E test team is responsible for acquiring, monitoring, controlling, and assuring the quality and security of all OT&E data. The TD will ensure the smooth flow of data to those responsible for data processing, reduction, analysis, and evaluation. Appropriate OT&E data and feedback will be continuously provided to the SM to enhance system development.

7.3.1. Validating Data. Validation of test data will be concurrent with test execution. The OT&E team will continuously evaluate test data to ensure it correctly captures measurements of preplanned MOEs and MOPs. The data will also be used to update existing M&S tools, or create new M&S tools for future analyses and predictions.

7.3.2. Reducing and Analyzing Data. The OT&E test team will process and evaluate test data in order to answer specific test objectives and COIs, and determine how well the system accomplishes mission essential tasks. The team will continually assess if the correct types and amounts of data are collected, and planned analytical techniques are working. Adjustments must be made as required to ensure the OT&E plan's COIs will be answered. The TD will ensure all data reduction tools are operationally verified prior to active testing.

7.3.3. Joint Reliability and Maintainability Evaluation Team (JRMET). The SM will establish a JRMET (or similar IPT) to assist in the collection, analysis, verification, and categorization of reliability and maintainability (R&M) data during DT&E and OT&E. A representative from the program office will chair the JRMET. The JRMET will include representatives from the RTO, PTO, OTA, operating command, contractor (nonvoting), and other participating commands and agencies. The JRMET will establish a common database from which members can independently evaluate the data according to their needs.

7.3.4. Test Data Scoring Board (TDSB). The TDSB is a government-only group which compiles, reviews, and scores all available R&M data and open DRs from DT&E and OT&E. The SM or OTA will establish a TDSB and designate a chairperson as agreed. The TDSB includes representatives from the SPO, RTO, PTO, OTA, operating command, and other participating commands and agencies.

7.3.5. Disposing of Test Data. Test directors will maintain original data to allow for additional analysis, if necessary. Otherwise, data will be disposed of according to AFI 37-138, *Records Disposition--Procedures and Responsibilities*. Key data should be properly archived if follow-on tests are anticipated. Ensure test results are used to recommend updates to M&S tools and DSM capabilities. Ensure EW signature characteristics (radar cross section, infrared, antenna patterns, etc.) are measured and recorded, and the information forwarded to the central signature data repository at the Air Force Information Warfare Center (AFIWC).

7.4. Monitoring DT&E and System Contractors. Operational testers will monitor as many government and contractor DT&E events as possible, concentrating their greatest efforts on those events which support combined DT&E/OT&E. The OTA, SM, and RTO must ensure any DT&E data, particularly contractor-generated data, are protected from tampering, improper collection methods, manipulation, bias, or conflict of interest. Operational testers will actively participate in the SM-conducted certification process as DT&E information is reviewed. The independent phase of combined DT&E/OT&E will be conducted just like other OT&E programs.

7.5. Conduct of Advanced Concept Technology Demonstrations (ACTD). The user-sponsor will request assistance from operational testers as needed on proposed ACTDs. After OTA participation in an ACTD is approved, operational test personnel will assist the user-sponsor team in ACTD planning and execution by providing test expertise and ensuring operational realism. The OTA will not conduct an OT&E per se, but will provide assistance as described in paragraphs **3.6.25.** and **6.8.4.** Due to the nature of these demonstrations, system contractors may be involved, and the ACTD program may later transition into a formal acquisition program. The operational tester's primary functions in these activities are to support the "user-sponsor" with cost effective and timely assistance, and to assess the system's military capabilities and limiations. Collection of data for future OA or OT&E efforts is a secondary consideration, and the prohibitions in Title 10 §2399 may not apply. Contact AF/TEP if there are questions.

7.6. Decertification of the System. Despite the developer's best efforts, systems may fail to perform as planned, and continuation of OT&E is not in the best interests of the government. In these cases, either the OTA commander or the certifying official may decertify the system and return it to DT&E. A decertification message is required. Before the system resumes dedicated OT&E, the certifying official must again certify the system after appropriate corrective actions have been taken. See AFMAN 63-119.

Chapter 8

TEST AND EVALUATION REPORTING

8.1. General Guidance. Test reports play important roles in system acquisition and deployment decisions. Operational test directors (TD) and test managers (TM) are responsible for implementing a responsive test reporting strategy and schedule. The structure of the OT&E or FDE gives TDs the flexibility to provide feedback to decision makers at significant points during the test program. Test directors must review the entire test effort and determine which types of reports are appropriate. During and immediately after test execution, several types of reports and briefings are required.

8.2. Significant Test Event Reports. These reports will briefly describe the circumstances and outcomes of significant test events that occur during I/QOT&E and FOT&E programs. The TD will submit these reports to the PEM, SM, user, HQ USAF/TE, among others, within 24 hours of completing any significant test event. Significant test events will be described in the OT&E plan and the TEMP.

8.3. Reporting Missile Launch Failures and Mishaps. Ground- or air-launched missiles which fail during OT&E or FDE may require special types of failure investigation and reporting. A formal investigation may not be required if the mishap involves no collateral damage or personal injury, and debris does not impact off range. The SPO or a MAJCOM-led Air-Launched Missile Analysis Group is normally the office of primary responsibility for the investigation. (See AFI 99-151, *Air-Launched Missile Analysis Group*.) As a minimum, the investigation will provide an engineering analysis report and summary which includes findings, causes, and recommended corrective actions. Test organizations and contractors may be required to provide technical expertise in investigating these incidents. Ensure a copy of the failure report is sent to the Air Force Safety Center. For more details, see AFI 91-204, *Safety Investigations and Reports,* Chapters 7 and 8.

8.4. Status Reports. Status reports provide periodic updates and summaries of important findings during OT&E. The TD will submit status reports in letter or message form with the contents tailored for individual program needs. Reporting frequency will be listed in the TEMP.

8.5. Annual Reports. The TD will submit annual reports for any OT&E lasting longer than one year. Reports are sent to the appropriate headquarters for relay to HQ USAF/TE and OSD/DOT&E, if required. Annual reports are formatted and coordinated the same as final OT&E reports.

8.6. Interim Summary Report. The TD will provide a timely interim summary report when the final report cannot be completed within 45 days of a milestone decision or other significant program decision. The interim summary report is especially important prior to a pending Defense Acquisition Board decision. This report summarizes OT&E results in sufficient detail to support the decision. It will be sent to the same addressees as the final OT&E report.

8.7. Final Reports. The TD is responsible for preparing the final test report. This executive-level document objectively answers the COIs, and reports system operational effectiveness and suitability to decision makers, planners, and operators. The report must strike the proper balance between the system's capabilities versus its limitations and deficiencies, while taking into account how well the system performed mission essential tasks.

8.7.1. Final OT&E Report Contents. The final OT&E report will provide a formal, timely, and permanent record of results for the current OT&E phase. Among other things, the final report contains: descriptions of COIs, MOEs, and MOPs; descriptions of test methods and limitations; definitive test results; system capabilities and limitations as measured against the ORD's requirements and mission description; prioritized DRs and their status if carried forward to FOT&E or FDE; conclusions; and recommendations. The report must discuss test results in terms of impacts to the mission and battle outcomes, if appropriate. For incremental and evolutionary systems, the report should establish a system baseline and provide feedback to developers for the next increment. All Category I DRs and the top 10 Category II DRs will be listed in the final report. Other OT&E phases, OAs, and events related to the OT&E will be reported in annexes. Detailed technical information should be published in separate data documents. Recommended final report content and format are in **Attachment 3** and AFPAM 99-116.

8.7.2. Final FDE Report Contents . The final FDE report provides the same types of information as a final OT&E report, but is tailored to the objectives of the test, and the decision makers' needs for information about system operation and sustainment. FDE reports will adhere to the same standards of analysis as for OT&E reports.

8.7.3. Schedule. The TD must ensure the final OT&E report is completed, approved by the test agency commander, and submitted through HQ USAF/TE to OSD no later than 60 calendar days after the last test event (90 calendar days for multiservice and joint tests). See **Table 6.1.**

8.7.4. Distribution. For all OSD OT&E oversight programs, test agencies will send four copies of all final OT&E reports directly to HQ USAF/TE. HQ USAF/TE will distribute copies to OSD/DOT&E and OUSD(A&T)/DTSE&E. For all other programs, information copies of all final reports will be sent to HQ USAF/TE.

8.8. Release Authority. The release of OT&E or FDE raw data or information may result in serious consequences for acquisition programs, ACTDs, or battlelab demonstrations. The appropriate public affairs office must approve release of significant or potentially controversial information.

8.8.1. Within the DoD. Test directors have release authority to offices within the DoD for on-site OT&E program information with the concurrence of the test agency commander. Information regarding DRs shall be released early and continuously to the SM to speed up improvement of the system. All releases of technical data, including plans and reports, must be according to AFI 61-204, *Disseminating Scientific and Technical Information*. Test directors cannot release classified information except as specified in DoDD 5200.1, *DoD Information Security Program*, and associated documents.

8.8.2. Outside the DoD. Test directors do not have release authority for OT&E information outside DoD channels. Freedom of Information Act requests should be processed according to AFI 37-131, *Freedom of Information Act Program*. Personnel involved in testing activities must know the restrictions for all communications related to the test program. Information released to Congress, the General Accounting Office, the DoD Inspector General, or similar agencies must follow the guidance in AFI 90-401, *Air Force Relations With Congress*, and AFI 65-401, *Relations With the General Accounting Office*. The Information Branch of the Office of the Vice Chief of Staff (HQ USAF/CVAII) will release information to NATO and foreign nationals.

8.8.3. Exemptions. OT&E reports are exempt from report control symbol licensing according to AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*.

8.9. Final OT&E Results Briefing Requirements. Test directors may not have sufficient time to publish final OT&E reports before milestone decision authorities need critical test information and results. The TD will summarize OT&E results for ACAT I and OSD oversight programs in an executive-level briefing to HQ USAF/TE, SAF/AQ, and OSD/DOT&E in sufficient time prior to the milestone decision, as agreed. The SM will present relevant programmatic, DT&E, and deficiency resolution information at the same briefing. The combined briefing must strike the proper balance between the system's capabilities and limitations, discuss the correction of system deficiencies, and address how well the system performed mission essential tasks. Schedule all briefings through AF/TEP. Allow sufficient time between briefings to answer decision makers' questions and deal with unforeseen issues.

8.10. Reporting of Operational Assessments (OA) and Operational Utility Evaluations (OUE). The report formats for OAs and OUEs will be tailored to the objectives of the program and its sponsors, and are given to senior leadership as required. The OA report is a progress report and not an evaluation. The OUE report may be a "final" report for programs such as ACTDs where no other OT&E activities are planned prior to a production decision. Recommended contents are in **Attachment 3** and AFPAM 99-116.

8.11. Reporting on Advanced Concept Technology Demonstrations (ACTD). Operational testers will provide the types of information requested by the ACTD user-sponsor and which most benefit the program. The results of the OTA's evaluation will be incorporated into the sponsor's final report on the ACTD. The OTA will only prepare a final report if the sponsor, CSAF, or DUSD(AT) requests. In all cases, the OTA's data will be preserved for later use as supplemental data in case additional testing is required.

8.12. Multiservice Operational Test and Evaluation (MOT&E). Participating services will prepare reports according to their respective regulations. The lead service will prepare a single MOT&E report summarizing the conclusions and recommendations from the participating services' reports. Rationale will be provided to explain any significant differences. The supporting services' reports will be attached to this single report. See the *Memorandum of Agreement on Multiservice Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation (JT&E).*

8.13. Lessons Learned Program . Anyone involved in the planning, execution, or reporting of AFOTEC-conducted OT&E programs will support the AFOTEC Lessons Learned Program. Positive as well as negative experiences are vital and must be submitted. Lessons learned should be submitted as they occur. The format for submitting AFOTEC lessons learned may be obtained from AFOTEC/XPY, DSN 246-9626. All other OT&E agencies are encouraged to provide a courtesy copy of their lessons learned to AFOTEC for possible inclusion in AFOTEC's data base.

8.14. Disposition of Test Assets. Test assets (e.g., instrumentation, office equipment, test articles) from canceled or completed tests will be properly disposed of. Useable items will be catalogued and turned over to other OT&E or weapon system sustainment programs, or refurbished and assigned back to owning

MAJCOMs or agencies. Surplus or unusable items will be turned over to the nearest Defense Reutilization Management Office.

JOHN T. MANCLARK
Director, Test and Evaluation

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Public Law 103-160 §220, *National Defense Authorization Act for Fiscal Year 1994*

Title 10, United States Code, *Armed Forces,* Sections 139, 2366, 2399, and 2400

Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*

Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01 (formerly MOP No. 77), *Requirements Generation System,* 13 Jun 97

Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6212.01A, *Compatibility, Interoperability, and Integration of Command, Control, Communications, Computers, and Intelligence Systems,* 30 Jun 95

Office of Management and Budget (OMB) Policy Letter 92-1, *Inherently Governmental Functions*, 23 Sep 92

Office of Management and Budget (OMB) Circular No. A-109, *Major System Acquisitions*, April 5, 1976

Department of Defense Directive (DoDD) 5000.1, *Defense Acquisition*, 15 March 96

DoD Regulation 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAP) and Major Automated Information System (MAIS) Acquisition Programs*, 15 March 96

DoD 5000.3-M-2, *Foreign Comparative Testing (FCT) Program*

DoD Directive 5134.1, *Under Secretary of Defense (Acquisition & Technology)*

DoD Directive 3200.11, *Major Range and Test Facility Base*

DoD Directive 5200.1, *DoD Information Security Program*

DoD Regulation 7000.14-R, Vol 2A, *Financial Management Regulation*

DoD Acquisition Deskbook

AFI 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*

AFI 10-706, *Electronic Warfare*

AFI 10-1901, *Air Force Battlelab Responsibilities, Processes, and Documentation*

AFM 11-1, *Air Force Glossary of Standardized Terms (obsolete, replacement in draft)*

AFI 14-206, *Modeling and Simulation*

AFI 16-301, *US Air Force Priority System for Resources Management*

AFI 16-1001, *Verification, Validation and Accreditation (VV&A)*

AFI 21-102, *Depot Maintenance Management*

AFI 21-115, *Product Quality Deficiency Report Program* (Formerly AFR 74-6)

AFI 25-201, *Support Agreement Procedures*

AFI 31-702, *System Security Engineering*

AFI 33-108, *Compatibility, Interoperability, and Integration of Command, Control, Communications, Computer (C4) Systems*

AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*

AFI 37-131, *Freedom of Information Act Program*

AFI 37-138, *Records Disposition--Procedures and Responsibilities*

AFI 37-160, Vol 8, *Air Force Forms Management Program*

AFI 61-204, *Disseminating Scientific and Technical Information*

AFPD 63-1, *Acquisition System*

AFI 63-101, *Acquisition System*

AFI 63-114, *Rapid Response Process*

AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation*

AFI 65-401, *Relations With the General Accounting Office*

AFI 65-601, Vol 1, *Budget Guidance and Procedures*

AFI 90-401, *Air Force Relations With Congress*

AFI 91-202, *The Air Force Mishap Prevention Program*

AFI 91-204, *Safety Investigations and Reports*

AFI 91-205, *Nonnuclear Munitions Safety Board*

AFPD 99-1, *Test and Evaluation Policy*

AFI 99-101, *Developmental Test and Evaluation*

AFOTEC Handbook 99-101, *Test Management and Policy Handbook*

AFI 99-105, *Live Fire Test and Evaluation*

AFI 99-106, *Joint Test and Evaluation*

AFI 99-108, *Programming and Reporting Missile and Target Expenditures in Test and Evaluation*

AFI 99-109, *Test Resource Planning*

AFI 99-114, *Foreign Material Program*

AFPAM 99-116, *Test and Evaluation Management Guide* (in development)

AFI 99-150, *Combat Air Forces Test and Evaluation* (in development)

AFI 99-151, *Air-Launched Missile Analysis Group*

AFMC Pamphlet 800-60, *Integrated Weapon System Management Guide*

HOI 800-2, *Policy and Guidance for Preparing Program Management Directives*

Single Acquisition Management Plan Guide, 29 Apr 96.

TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*

MIL-STD-498, *Software Development and Documentation*

Memorandum of Agreement on Multiservice Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation (JT&E), updated annually

NOTE:
The user of this instruction is responsible for verifying the currency of the cited documents.

Abbreviations and Acronyms

ACAT—acquisition category

ACTD—advanced concept technology demonstration

ADM—Acquisition Decision Memorandum

AF—Air Force

AFAE—Air Force Acquisition Executive

AFCA—Air Force Communications Agency

AFDTC—Air Force Development Test Center

AFFTC—Air Force Flight Test Center

AFI—Air Force instruction

AFIWC—Air Force Information Warfare Center

AFMAN—Air Force manual

AFMC—Air Force Materiel Command

AFOTEC—Air Force Operational Test and Evaluation Center

AFPAM—Air Force pamphlet

AFPD—Air Force policy directive

AFRC—Air Force Reserve Command

AIS—automated information system

ALC—Air Logistics Center

ANG—Air National Guard

Ao—availability

AoA—analysis of alternatives (formerly COEA)

APA/EW—Aircraft-Propulsion-Avionics/Electronic Warfare

APB—Acquisition Program Baseline

APDP—Acquisition Professional Development Program

ATPS—Automated Test Planning System

BI—battlelab initiative

CaNDI—commercial and nondevelopmental items

CAF—Combat Air Forces

C4—command, control, communications, and computers

C4I—command, control, communications, computers, and intelligence

CDRL—contract data requirements list

CII—compatibility, interoperability, and integration

CJCSI—Chairman of the Joint Chiefs of Staff instruction COEA cost and operational effectiveness analysis (replaced by AoA)

COI—critical operational issue

COTS—commercial off-the-shelf

CRD—capstone requirements document

CRWG—Computer Resources Working Group

CSAF—Chief of Staff of the Air Force

CTEIP—Central Test and Evaluation Investment Program

CTF—combined test force

DAB—Defense Acquisition Board

DAC—designated acquisition commander

DoD—Department of Defense

DoDD—Department of Defense directive

DoDI—Department of Defense instruction

DR—deficiency report or deficiency reporting

DSM—digital system model

DSN—Defense switched network

DT&E—developmental test and evaluation

DTIC—Defense Technical Information Center

EA—evolutionary acquisition

e.g.—*exempli gratia,* meaning “for example”

EOA—early operational assessment

EW—electronic warfare

FCT—Foreign Comparative Test

FDE—force development evaluation

FME—foreign military equipment

FOA—field operating agency

FOT&E—follow-on operational test and evaluation

FY—fiscal year

GFE—government furnished equipment

HITL—hardware-in-the-loop

HQ USAF—Headquarters United States Air Force

HOI—Headquarters Operating Instruction

HTSA—host-tenant support agreement

ILS—integrated logistics support

ILSP—Integrated Logistics Support Plan

IOC—initial operational capability

IOT&E—initial operational test and evaluation

IPPD—integrated product and process development

IPT—integrated product team

IV&V—independent verification and validation

JCS—Joint Chiefs of Staff

JITC—Joint Interoperability Test Command

J-MASS—Joint Modeling and Simulation System

JP—Joint Publication

JRMET—Joint Reliability and Maintainability Evaluation Team

JSIMS—Joint Simulation System

JT&E—joint test and evaluation

JWARS—Joint Warfare System

KPP—key performance parameter

LFT&E—live fire test and evaluation

LOA—letter of agreement

LT&E—logistics test and evaluation

LRIP—low-rate initial production

LSA—logistics support analysis

MAA—mission area assessment

MAD—mission area director

MAIS—major automated information system

MAJCOM—major command

MAP—mission area plan

MCOTEA—Marine Corps Operational Test and Evaluation Agency

MDA—milestone decision authority

MDAP—major defense acquisition program

MIPRB—Materiel Improvement Program Review Board

MNA—mission needs analysis

MNS—mission need statement

MOA—memorandum of agreement

MOE—measure of effectiveness

MOP—measure of performance; also memorandum of policy

MOT&E—multiservice operational test and evaluation

MOU—memorandum of understanding

MRTFB—Major Range and Test Facility Base

MS—milestone

M&S—modeling and simulation

NBC—nuclear, biological and chemical

NDI—nondevelopmental item

NNMSB—Nonnuclear Munitions Safety Board

OA—operational assessment

OAR—open-air range

O&M—operations and maintenance

OCR—office of collateral responsibility

OIPT—overarching integrated product team

OMB—Office of Management and Budget

OPR—office of primary responsibility

OPSEC—operations security

OPTEC—Operational Test and Evaluation Command

OPTEVFOR—Operational Test and Evaluation Force

ORD—operational requirements document

O&M—operations and maintenance

OSD—Office of the Secretary of Defense

OTA—operational test agency

OT&E—operational test and evaluation

OUE—operational utility evaluation

P3I—preplanned product improvement

PEM—program element monitor

PEO—program executive officer

PID—program introduction document

PM—program manager, the single manager (SM)

PMD—program management directive

POC—point of contact

POM—Program Objective Memorandum

PTO—participating test organization

QOT&E—qualification operational test and evaluation

QT&E—qualification test and evaluation

RCM—requirements correlation matrix

R&D—research and development

RDT&E—research, development, test, and evaluation

REP—Resource Enhancement Project

RFP—request for proposal

R&M—reliability and maintainability

RTO—responsible test organization

SAE—Service Acquisition Executive

SAF—Secretary of the Air Force

SAMP—Single Acquisition Management Plan

SECDEF—Secretary of Defense

SFTC—Single-Face-to-Customer

SM—single manager

SMM—system maturity matrix

SPO—system program office

STA—system threat assessment

STAR—system threat assessment report

T&E—test and evaluation

TBD—to be determined

TD—test director

TD&E—tactics development and evaluation

TDSB—Test Data Scoring Board

TIPP—Test Investment Planning Process

TEMP—test and evaluation master plan

TM—test manager

TO—technical order

TPWG—Test Planning Working Group

TRP—test resources plan

TRR—Test Readiness Review

VV&A—verification, validation and accreditation

WSEP—Weapon System Evaluation Program

Terms

NOTE:
Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 1 Dec 1989, and AFM 11-1, *Air Force Glossary of Standardized Terms*, contain standardized terms and definitions for DoD and Air Force use.

Acquisition Category (ACAT)—Acquisition categories determine the level of review, decision authority, and applicable procedures. They facilitate decentralized decision making and execution, and compliance with statutorily imposed requirements. There are three ACATs based on research, development, test, and evaluation (RDT&E) and/or procurement costs stated in FY 96 dollars:

ACAT I programs are major defense acquisition programs (MDAP) requiring eventual expenditure for RDT&E of more than $355 million, or procurement of more than $2.135 billion.

There are two sub-categories of ACAT I programs:

ACAT ID means the program is subject to Defense Acquisition Board (DAB) oversight, and the Milestone Decision Authority (MDA) is USD(A&T).

ACAT IC means the MDA is the component head, or Service Acquisition Executive (SAE).

ACAT IA programs are major automated information systems (MAIS) requiring program costs for any single year in excess of $30 million, total program costs in excess of $120 million, or total life-cycle costs in excess of $360 million, or those designated by ASD(C3I) to be ACAT IA.

There are two subcategories of ACAT IA programs:

ACAT IAM means the MDA is ASD(C3I).

ACAT IAC means the MDA is the component DAC.

ACAT II programs are major systems requiring eventual expenditure for RDT&E of $140 million, or procurement of more than $645 million.

ACAT III programs are those systems not meeting the requirements for ACAT I or ACAT II programs.

Acquisition Community—All personnel involved in the conceptualization, initiation, design, development, test, contracting, production, deployment, sustainment, logistics support, modification, and disposal of weapon and other systems, supplies, or services to satisfy DoD needs, and intended for use in or in support of military missions.

Acquisition Decision Memorandum (ADM)—A memorandum signed by the milestone decision authority documenting the decisions made and the exit criteria established as the result of a milestone decision review or in-process review. (DoD Acquisition Deskbook)

Acquisition Phases—The logical parts of an acquisition program, separated by milestone decision points, during which broadly stated mission needs are progressively translated into well-defined system-specific requirements. The number of phases shall be tailored to meet the specific needs of individual acquisition programs. The four acquisition phases are:

Phase 0	Concept Exploration
Phase I	Program Definition and Risk Reduction
Phase II	Engineering and Manufacturing Development
Phase III	Production, Fielding/Deployment, and Operational Support

Acquisition Process—The system of discrete, logical phases separated by major decision points called milestones. The acquisition process begins when broad mission needs are identified which cannot be satisfied with nonmateriel solutions (AFI 63-101).

Acquisition Program Baseline (APB)—A succinct document that details cost, schedule, and performance (including support) parameters and program breach information. It establishes the commitment between the program manager and the Milestone Decision Authority (AFI 63-101).

Acquisition System—A single uniform system whereby all equipment, facilities, and services are planned, designed, developed, tested, acquired, maintained, and disposed of within the DoD. The system consists of policies and practices that govern acquisitions, to include documenting mission needs and establishing performance goals and baselines; determining and prioritizing resource requirements for acquisition programs; planning and executing acquisition programs; directing and controlling the acquisition review process; developing and assessing logistics implications; contracting; monitoring the execution status of approved programs; and reporting to Congress. See DoDD 5134.1, *Under Secretary of Defense (Acquisition & Technology).*

Advanced Concept Technology Demonstration (ACTD)—A means of rapidly demonstrating the use of advanced technologies to address urgent military needs. ACTDs are designed to rapidly transfer technology from developers to users. Demonstrations are jointly developed and implemented with the operational user, tester, and development communities as key participants. The fundamental goals are to provide a sound basis for investment decisions, and provide residual operational capabilities. ACTDs are partially funded by OSD.

Automated Information System (AIS)—A combination of computer hardware and software, data, or telecommunications that performs functions such as collecting, processing, transmitting, and displaying information. Excluded are computer resources, both hardware and software, that are physically part of, dedicated to, or essential in real time to the mission performance of weapons systems. (DoDD 5000.1)

Availability (Ao)—A measure of the degree to which an item is in the operable and commitable state at the start of a mission when the mission is called for at an unknown (random) time.

Certification (Certify)—To formally confirm or ratify through observation, or the review of documentation and other evidence. Distinct from the term "testing." For systems with CII requirements, certification confirms that CII attributes were properly described, adequately tested and evaluated, and will meet the users' operational requirements. Certification also is a formal review process for programs to ensure readiness to start dedicated OT&E.

Combined Test Force (CTF)—An integrated T&E product team empowered to evaluate a weapon system by collocating its major members at one primary test site. The requirements, resources, test objectives, and leadership of various test efforts are integrated to achieve higher levels of efficiency. As a minimum, representatives from the DT&E and OT&E communities, contractors, and operating commands will be members.

Combined Testing—Testing conducted by the developmental and operational testers to achieve cost and schedule advantages. The high cost or lack of sufficient test articles provides a great incentive for DT&E and OT&E teams to share test resources and data. Combined testing usually ends with a phase of dedicated OT&E._

Commercial Item—Any item, other than real property, that is of a type customarily used by the general public or by nongovernmental entities for purposes other than governmental purposes. Any item that evolved from such an item through advances in technology or performance and that is not yet available in the commercial market place. A nondevelopmental item. (See Title 41 §403(12), or Federal Acquisition Regulation Part 201, for a complete definition.)

Compatibility—The capability of two or more items or components of equipment or material to exist or function in the same system or environment without mutual interference (CJCSI 6212.01A).

Concurrency—The production of a system while developmental activities are still ongoing. The risk in concurrency is that of producing large numbers of units, the configuration of which might later prove to be ineffective or unsuitable.

Covered System—A term used to denote systems which must undergo live fire test and evaluation (LFT&E) and which are on OSD's LFT&E Oversight List. A vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat, and that is a major system (Title 10 §2366).

Operational Issue (COI)—A key question that must be examined in operational test and evaluation to determine the system's capability to perform its mission. Testers normally phrase a COI as a question to be answered in evaluating a system's operational effectiveness or suitability.

Defense Acquisition Deskbook—An automated repository of information consisting of an electronic Desk Reference Set, a Tool Catalog, and a Forum for the exchange of information. The Reference Set organizes information into two main categories: mandatory guidance; and discretionary information.

Deficiency—A condition that prevents successful mission accomplishment, or degrades a system's operational effectiveness or suitability (TO 00-35D-54).

Deficiency Report (DR)—The report used to identify, document, and track system deficiency and enhancement data while a system is in advanced development, T&E, or operational transition (TO 00-35D-54).

Designated Acquisition Commander (DAC)—The individual who functions as the milestone decision authority (MDA) on programs not assigned to a PEO. The commanders of product centers and air logistics centers act in this capacity. Like PEOs, DACs are accountable to the Service Acquisition Executive (SAE) (AFPD 63-1).

Developmental Test and Evaluation (DT&E)—Test and evaluation conducted to evaluate design approaches, validate analytical models, quantify contract technical performance and manufacturing quality, measure progress in system engineering design and development, minimize design risks, predict integrated system operational performance (effectiveness and suitability) in the intended environment, and identify system problems (or deficiencies) to allow for early and timely resolution or correction. DT&E usually includes contractor testing (AFPD 99-1).

Dormant Reliability—The probability that an item will remain failure free for a specified period of time in a non-operating mode under stated environmental conditions. When the system is removed from the dormant stage, it is expected to perform within specifications.

Early Operational Assessment (EOA)—An operational assessment (OA) conducted before or at MS II (DoD Acquisition Deskbook). An EOA assesses the most promising design approach sufficiently early in the acquisition process to assure it has the potential to fulfill user requirements. Also see operational assessment.

Evaluation Criteria—Standards by which the accomplishment of required technical and operational effectiveness and/or suitability characteristics, or resolution of operational issues, may be addressed (DoD Acquisition Deskbook).

Evolutionary Acquisition (EA)—An acquisition strategy in which a core capability is fielded, and the system design has a modular structure and provisions for future upgrades and changes (increments) as requirements are refined. This strategy is well suited to high technology and software intensive programs where requirements beyond a core capability can generally, but not specifically, be defined. The evolutionary acquisition strategy differs from incremental acquisition because the total functional capability is not completely defined at program inception, but evolves as the system is built.

Exit Criteria—A set of specific accomplishments that must be satisfactorily demonstrated before a program progresses further in the current acquisition phase, or transitions to the next acquisition phase. Exit criteria may include such factors as critical test issues, the attainment of projected growth curves and baseline parameters, and the results of risk reduction efforts. Exit criteria supplement minimum required accomplishments and are specific to each acquisition phase (DoD Acquisition Deskbook).

First Article—The preproduction models, initial production samples, test samples, first lots, pilot models, and pilot lots.

Follow-on Operational Test and Evaluation (FOT&E)—The continuation of IOT&E or QOT&E activities past the MS III decision. FOT&E answers specific questions about unresolved COIs and test issues, or completes areas not finished during the I/QOT&E. It ensures the initial system acquisition process is complete.

Force Development Evaluation (FDE)—The evaluation, demonstration, exercise, or analysis of fielded, operational systems during the sustainment portion of the system life cycle. FDE focuses on the MAJCOMs' operational employment and sustainment of fielded systems after I/QOT&E, and/or FOT&E are complete.

Foreign Comparative Test (FCT)—A DoD T&E program centrally managed by OSD which provides

funding for U.S. T&E of selected equipment items and technologies developed by allied or friendly countries when such items or technologies are identified as having good potential to satisfy valid DoD requirements. (See DoD 5000.3-M-2, *Foreign Comparative Testing (FCT) Program.*)

Hardware-in-the-Loop (HITL)—Testing that involves system or subsystem hardware in an open or closed-loop mode against high fidelity targets and threat simulations. It allows testers to test developmental and production systems under controllable, repeatable, nondestructive conditions.

Implementing Command—The lead command or agency designated by the Service Acquisition Executive to manage an acquisition program.

Incremental Acquisition—An acquisition strategy which develops and deploys systems or functionality through a number of clearly defined increments that stand on their own. The number, size, and phasing of all increments must be defined for the total system. This strategy is most appropriate when user requirements are well understood and easily defined, but a phased approach is more prudent or beneficial.

Independent Verification and Validation (IV&V)—The conduct of verification and validation of a model or simulation by individuals or agencies that did not develop the model or simulation. (See Verification, Validation and Accreditation.)

Initial Operational Test and Evaluation (IOT&E)—The operational test and evaluation conducted on production or production-representative articles to help decide whether to proceed beyond low-rate initial production. IOT&E is conducted to measure how well the system attains operational effectiveness and suitability (DoD 5000.2-R).

Integrated Logistics Support (ILS)—A composite of all support considerations necessary to ensure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation (JP 1-02). A disciplined, unified, and iterative approach to management and technical activities necessary to integrate the needed level of support into system and equipment design; develop support requirements that consistently relate to readiness objectives, design, and other support requirements; and gives the required support during the operational phase at a minimum cost.

Integrated Logistics Support Plan (ILSP)—An Air Force management plan for the integrated logistics support (ILS) process. This plan includes ILS elements that are integrated with each other and also with program planning, engineering, designing, testing, and evaluation during production and operation. It integrates support elements with the mission elements of a system throughout its life cycle. (DoD 5000.2-R)

Integration—The arrangement of systems in an architecture so that they function together in an efficient and logical way (CJCSI 6212.01A).

Interoperability—The capability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use these services to help them operate effectively together. The conditions achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users (CJCSI 6212.01A).

Joint Program—Any defense acquisition system, subsystem, component, or technology program involving formal management or funding by more than one DoD component during any phase of a system's life cycle.

Joint Reliability and Maintainability Evaluation Team (JRMET)—The team responsible for

collecting, analyzing, and categorizing R&M data during DT&E and OT&E. It is chaired by the SM (or his representative) and includes representatives from the supporting and operating commands, the DT&E and OT&E test teams, and when appropriate, system contractor personnel as nonvoting members.

Joint Test and Evaluation (JT&E)—JT&E programs evaluate technical or operational concepts which are applicable to more than one service. JT&E candidate programs are nominated by the services, and directed and funded by OSD. They usually do not result in the acquisition of systems.

Lead Service—The service designated by USD(A&T) to be responsible for management of a system acquisition involving two or more DoD components in a joint program.

Lethality—The ability of a munition system (or laser, high-power microwave, etc.) to cause damage that results in the loss or degradation of the ability of a target system to complete its designated mission(s) (DoD 5000.2-R, Appendix IV).

Life Cycle Cost—The total cost to the government of acquisition and ownership of a system over its useful life. It includes the cost of development, acquisition, support and, where applicable, disposal (DoD Acquisition Deskbook).

Live Fire Test and Evaluation (LFT&E)—A test within the OSD-approved LFT&E strategy involving the firing of actual munitions at target components, subsystems, subassemblies, or system-level targets (which may or may not be configured for combat) to examine personnel casualty, vulnerability and/or lethality issues (Title 10 §2366; DoD 5000.2-R, Appendix IV).

Logistics Supportability—The degree to which the planned logistics support allows the system to meet its availability and wartime usage requirements. Planned logistics support includes the following: test, measurement, and diagnostic equipment; spare and repair parts; technical data; support facilities; transportation requirements; training; manpower; and software (DoD Acquisition Deskbook).

Logistics Test and Evaluation (LT&E)—The test methodology, criteria, and tools for evaluating and analyzing the 10 Integrated Logistics Support (ILS) elements as they apply to a system under test. The objective is to influence the design through applying the ILS elements as early as possible in the acquisition cycle. LT&E integrates the evaluation and analysis efforts of R&M, human factors engineering, and logistics test, and is an integral part of the DT&E report.

Low-Rate Initial Production (LRIP)—The minimum number of systems (other than ships and satellites) to provide production representative articles for operational test and evaluation, to establish an initial production base, and to permit an orderly increase in the production rate sufficient to reach full-rate production upon successful completion of operational testing (DoD Acquisition Deskbook).

Maintainability—The capability of an item to be retained in or restored to a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair (DoD Acquisition Deskbook).

Major Automated Information System (MAIS)—An AIS acquisition program that is (1) designated by ASD(C3I) as a MAIS, or (2) estimated to require program costs in any single year in excess of $30 million in FY 1996 constant dollars, total program costs in excess of $120 million in FY 1996 constant dollars, or total life-cycle costs in excess of $360 million constant dollars. MAISs do not include highly sensitive classified programs (as determined by SECDEF). See DoD Acquisition Deskbook.

Major Defense Acquisition Program (MDAP)—An acquisition program that is not a highly sensitive classified program (as determined by SECDEF) and that is: (1) designated by USD(A&T) as an MDAP;

or (2) is estimated by USD(A&T) to require an eventual total expenditure for RDT&E of more than $355 million in FY 1996 constant dollars, or for procurement, of more than $2.135 billion dollars in FY 1996 constant dollars. An ACAT I program. See DoD Acquisition Deskbook and Title 10 §2430.

Major System—A combination of elements that will function together to produce the capabilities required to fulfill a mission need. The elements may include hardware, equipment, software, or any combination thereof, but excludes construction or other improvements to real property. A system shall be considered a major system if it is estimated by USD(A&T) to require an eventual total expenditure for RDT&E of more than $115 million in FY 1990 constant dollars (approximately $140 million in FY 1996 constant dollars), or for procurement of more than $540 million in FY 1990 constant dollars (approximately $645 million in FY 1996 constant dollars). An ACAT II program. See DoD Acquisition Deskbook and Title 10 §2302(5).

Measure of Effectiveness (MOE)—A qualitative or quantitative measure of a system's performance or a characteristic that indicates the degree to which it performs the task or meets a requirement under specified conditions. Where possible, MOEs should be defined to measure operational capabilities in terms of engagement or battle outcomes (AFI 10-601).

Measure of Performance (MOP)—A quantitative measure of the lowest level of physical performance (e.g., range, velocity, payload) (AFI 10-601).

Measurement Facility—Part of the test infrastructure used to quantify the capabilities and limitations of new systems and technologies. Types of data collected include antenna patterns, radar cross sections, engine performance, and infrared and laser signatures.

Milestone (MS)—A decision point separating the phases of an acquisition program requiring OSD or DoD component program review or both. Milestones include both Defense Acquisition Board (DAB) and equivalent program reviews for DoD components. The four milestones are:

MS 0	Approval to Conduct Concept Studies
MS I	Approval to Begin a New Acquisition Program
MS II	Approval to Enter Engineering and Manufacturing Development
MS III	Production or Fielding/Deployment Approval

Milestone Decision Authority (MDA)—The individual designated according to criteria established by USD(A&T), or by ASD(C3I) for AIS programs, to approve entry of an acquisition program into the next phase (DoD Acquisition Deskbook).

Mission Need Statement (MNS)—A document prepared by users to identify a requirement for a materiel solution to satisfy a mission deficiency (DoD 5000.2-R and AFI 10-601). The MNS is prepared according to CJCSI 3170.01.

Modification—A change to a system that is still in production. A "major modification" is a modification that in and of itself meets the criteria of an ACAT I or II, or is designated as such by the MDA.

Monitor—Mid-level management's observation of programs to ensure compliance with procedures and attainment of day-to-day program goals.

Multiservice Test and Evaluation—Test and evaluation (T&E) conducted by two or more DoD components for systems to be acquired by more than one DoD component, or T&E of a DoD component's systems that must be interoperable with another DoD component.

Nondevelopmental Item (NDI)—Any commercial item. Any previously developed item of supply that is in use by a department or agency of the United States. Any item of supply that requires only minor modification or modification of the type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency. (See Title 41 §403(13), or Federal Acquisition Regulation, Part 201, for a complete definition.)

Objective—There are two recognized definitions: (1) An operationally significant increment above the threshold. An objective value may be the same as the threshold when an operationally significant increment above the threshold is not identifiable or useful (CJCSI 3170.01 and AFI 10-601). (2) That value desired by the user and which the SM is contracting for or otherwise attempting to obtain. The objective value could represent an operationally meaningful, time-critical, and cost effective increment above the threshold for each program parameter. Program objectives (parameters and values) may be refined based on the results of the preceding program phase(s) (DoD 5000.2-R).

Operating Command—The command operating (using) a system, subsystem, or item of equipment. Generally applies to those operational commands or organizations designated by HQ USAF to conduct or participate in operations or operational testing (AFI 10-601). Often interchanged with the terms "user" or "using command."

Operational Assessment (OA)—An analysis of potential operational effectiveness and suitability made by an independent operational test activity, with user support as required, on other than production systems. The focus of an operational assessment is on significant trends noted in development efforts, programmatic voids, areas of risk, adequacy of requirements, and the ability of the program to support adequate operational testing. Operational assessments may be made at any time using technology demonstrators, prototypes, mockups, engineering development models, or simulations, but will not substitute for the independent OT&E necessary to support full production decisions (DoD Acquisition Deskbook).

Operational Effectiveness—The overall degree of mission accomplishment of a system used by representative personnel in the environment planned or expected (e.g., natural, electronic, threat) for operational employment of the system which considers organization, doctrine, tactics, survivability, vulnerability, and threat (including countermeasures and initial nuclear weapons effects, nuclear, biological, and chemical [NBC] contamination threats) (DoD Acquisition Deskbook).

Operational Requirements Document (ORD)—There are two current definitions: (1) A formatted statement containing performance and related operational parameters for the proposed concept or system (CJCSI 3170.01). (2) A document prepared by the operating command that describes quantitative and qualitative performance, operation, and support parameters, characteristics, and requirements for a specific candidate weapon system. The Air Force requires a mandatory attachment, the requirements correlation matrix (RCM) (AFI 10-601).

Operational Suitability—The degree to which a system can be placed satisfactorily in field use with consideration given to availability, compatibility, transportability, interoperability, reliability, wartime usage rates, maintainability, safety, human factors, manpower supportability, logistics supportability, natural environmental effects and impacts, documentation, and training requirements (DoD Acquisition Deskbook).

Operational Test Agency (OTA)—Each service has one designated operational test agency: the Air Force has the Air Force Operational Test and Evaluation Center (AFOTEC); the Navy has the Operational Test and Evaluation Force (OPTEVFOR); the Army has the Operational Test and Evaluation Command

(OPTEC); and the Marine Corps has the Marine Corps Operational Test and Evaluation Agency (MCOTEA). **NOTE:** A less common use of the term OTA is for any agency responsible for managing the OT&E of a system as designated in the PMD or other appropriate directives.

Operational Test and Evaluation (OT&E)—Testing and evaluation conducted in as realistic an operational environment as possible to estimate the prospective system's operational effectiveness and operational suitability. In addition, OT&E provides information on organization, personnel requirements, doctrine, and tactics. It may also provide data to support or verify material in operating instructions, publications, and handbooks (AFM 11-1).

Operational Utility Evaluation (OUE)—Highly streamlined, flexible OT&E activities designed to obtain quick-look assessments of military worth. They are used anytime testing does not fall into one of the other major categories of OT&E. OUEs are highly flexible in planning and reporting formats, and adjustable to customer needs. They are conducted outside the normal scope of operational testing activities, and are limited in time, scope, and resources. They may be used when required information cannot be obtained from OT&E, but will not be used in lieu of IOT&E, QOT&E, or FOT&E.

Operations Security (OPSEC)—A process of identifying critical information and analyzing friendly actions attendant to military operations and other activities to: identify those actions that can be observed by adversary intelligence systems; determine indicators hostile intelligence systems might obtain that could be interpreted or pieced together to derive critical information in time to be useful to adversaries; select and execute measures to eliminate or reduce to an acceptable level the vulnerabilities of friendly actions to adversary exploitation(JP 1-02).

Oversight—Senior executive-level review of programs to ensure compliance with policy and attainment of broad program goals.

Oversight Program—An acquisition program on OSD's Test and Evaluation Oversight List which is jointly published by DOT&E and DTSE&E. The list includes ACAT I (MDAP) and ACAT IAM programs, and other programs designated for T&E oversight. The master list designates oversight for DT&E, OT&E, and LFT&E. These programs require additional documentation, and have additional review and approval requirements. See DoD 5000.2-R for details.

Participating Command—A HQ USAF-designated command or agency that takes an active part in developing a system, and supports and advises the SM. The supporting command is also a participating command (AFI 10-601).

Participating Test Organization (PTO)—A test organization required to provide specific resources during DT&E or OT&E.

Phase—See acquisition phase.

Preplanned Product Improvement (P3I)—A phased acquisition approach that incrementally satisfies operational requirements in order to address the cost, risk, or relative time urgency of different elements of the system being developed. The deferred elements are developed in parallel or subsequent efforts. P3I includes enhancements planned for ongoing systems that go beyond the current performance envelope.

Production Article—An article that is in final form, employs standard parts (or nonstandard parts approved by the agency concerned), and is representative of final equipment.

Program Management Directive (PMD)—The official Air Force document used to direct acquisition

or modification responsibilities to the appropriate MAJCOM, PEO, or DAC for a specific system and subsystem's development, acquisition, concept direction study, or modification. The PMD states the program's unique requirements, goals, and objectives, especially those to be met at each acquisition milestone or program review (HOI 800-2).

Prototype—A model suitable for evaluation of design, performance, and production potential (Joint Pub 1-02). The Air Force also uses prototypes during development of a technology or acquisition program for verification or demonstration of technical feasibility. Prototypes may not be representative of the final production item.

Qualification Operational Test and Evaluation (QOT&E)—The operational testing performed on programs instead of IOT&E for which there is no RDT&E-funded development effort.

Qualification Test and Evaluation (QT&E)—The testing performed on systems and on modifications to existing systems for which there is no RDT&E-funded development effort (AFPD 99-1).

Reliability—The capability of a system and its parts to perform its mission without failure, degradation, or demand on the support system (DoD Acquisition Deskbook).

Requirement—The validated need of an operational user. Initially expressed in broad operational capability terms in the format of a MNS. It progressively evolves to system-specific performance requirements in the ORD (CJCSI 3170.01).

Requirements Correlation Matrix (RCM)—A three-part matrix or spreadsheet required by the Air Force to provide an audit trail of system capabilities and characteristics identified in the ORD. It lists thresholds and objectives, identifies user recommended key performance parameters, provides supporting rationale justifying each threshold, and preserves rationale for changes in requirements as the system matures (AFI 10-601).

Research, Development, Test and Evaluation (RDT&E)—The type of funding appropriation (3600) intended for research, development, test and evaluation efforts. See DoD 7000.14-R, Vol 2A, *Financial Management Regulation*, and AFI 65-601, Vol I, *Budget Guidance and Procedures*. **NOTE**: the term "research and development" (R&D) broadly covers the work performed by a government agency or the private sector. "Research" is the systematic study directed toward fuller scientific knowledge or understanding of a subject area. "Development" is the systematic use of the knowledge and understanding gained from research for the production of useful materials, devices, systems, or methods. R&D includes all supporting test and evaluation activities, to include IOT&E.

Responsible Test Organization (RTO)—The lead government entity that is qualified and responsible for DT&E.

Risk—A subjective assessment made regarding the likelihood or probability of not achieving a specific objective by the time established with the resources provided or requested. It also refers to overall program risk (DoD Acquisition Deskbook).

Single-Face-to-Customer (SFTC)—Office One of three single points of contact providing comprehensive up-front planning assistance to test organizations. Organized around mission areas rather than the test centers, these offices facilitate early T&E planning for new programs, major modifications, P3Is, and T&E investment planning. The three SFTCs are Airframe-Propulsion-Avionics/Electronic Warfare (AFA/EW), Armament/Munitions-C^4I, and Space.

Single Manager (SM)—A government official (military or civilian) who is responsible and accountable

for decisions and overall management (to include all cost, schedule, performance, and sustainment) of a system, product group, or materiel group. Also known as system program director, program manager, product group manager, or materiel group manager (AFMC Pamphlet 800-60).

Specification—There are many types of "specifications." A document intended primarily for use in procurement which clearly and accurately describes the essential technical requirements for items, materials, or services, including the procedures by which it will be determined that the requirements have been met. Also called "military specifications."

Specification, Performance-Based—Under acquisition reform, new systems must be described in terms of performance, and must let bidders propose the "how to" details. Performance-based specifications describe only "what" is needed and eliminate "how to" information. Only form, fit, and function descriptions are given; detailed configuration management controls and production baseline descriptions are left to the contractor. Also known as "commercial item descriptions" or "nongovernment standards."

Supporting Command—The command (usually Air Force Materiel Command) responsible for providing logistics support for a system (AFI 21-102).

Survivability—The capability of a system and crew to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission. Its components are susceptibility and vulnerability.

Susceptibility—The degree to which a weapon system is open to effective attack due to one or more inherent weaknesses. (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.) Susceptibility is considered a subset of survivability (DoD 5000.2-R, Appendix III).

Sustainment—Activities that sustain systems during the operations and support phases of the system life cycle. Such activities include any investigative test and evaluation (T&E) which extends the useful military life of systems, or expands the current performance envelope or capabilities of fielded systems. Sustainment activities also include T&E for modifications and upgrade programs, and may disclose system or product deficiencies and enhancements that make further acquisitions necessary.

System Maturity Matrix (SMM)—An acquisition management tool used to aid management in tracking a program's technical progress and risks. The SMM links user requirements and system specifications with anticipated T&E results. It provides a metric for program monitoring and reporting so true progress toward verification of capabilities and requirements can be assessed. The SMM is coordinated with the user and OTA, and approved by the PEO or DAC. The SMM is not a substitute for a valid requirements document.

Test and Evaluation (T&E)—The act of generating empirical data during the research, development or sustainment of systems, and the creation of information through analysis that is useful to technical personnel and decision makers for reducing design and acquisition risks. The process by which systems are measured against requirements and specifications, and the results analyzed so as to gauge progress and provide feedback.

Threshold—There are two recognized definitions: (1) The minimum acceptable operational value for a system capability or characteristic below which the utility of the system becomes questionable. A minimum acceptable operational value for a system capability or characteristic which, in the user's judgment, is necessary to provide an operational capability that will satisfy the mission need (CJCSI 3170.01 and AFI 10-601); (2) The minimum acceptable value which, in the user's judgment, is necessary

to satisfy the need. If threshold values are not achieved, program performance is seriously degraded, the program may be too costly, or the program may no longer be timely. The spread between objective and threshold values shall be individually set for each program based on the characteristics of the program (e.g., maturity, risk) (DoD 5000.2-R).

pgrade—A change to a system that is out of production. See "Modification."

User—See operating command.

Using Command—See operating command.

Verification, Validation & Accreditation (VV&A)—(1) ***Verification***: The process of determining that a model implementation accurately represents the developer's conceptual description and specifications. (2) ***Validation***: The process of determining (a) the manner and degree to which a model is an accurate representation of the real-world from the perspective of the intended uses of the model, and (b) the confidence that should be placed on this assessment. (3) ***Accreditation***: The official certification by users that a model or simulation is acceptable for use for a specific purpose. VV&A is a continuous process in the life cycle of a model as the model gets upgraded or is used for different applications.

Vulnerability—The characteristics of a system which cause it to suffer a definite degradation (loss or reduction of capability to perform its designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man-made) hostile environment. Vulnerability is considered a subset of survivability.

Attachment 2

RECOMMENDED OT&E PLAN CONTENT AND FORMAT

CONTENTS

B OPERATIONS SECURITY

C CLASSIFIED EVALUATION CRITERIA

D DETAILED SYSTEM DESCRIPTION

E (Not Used)

F (Not Used)

G SOFTWARE EVALUATION

H HUMAN FACTORS

I WEATHER

J MODELING & SIMULATION

GLOSSARY OF TERMS

REFERENCES

DISTRIBUTION

NOTE: Details and explanations of the Recommended OT&E Plan Content and Format are found in AFPAM 99-116.

Attachment 3

RECOMMENDED OT&E FINAL REPORT CONTENT AND FORMAT

CONTENTS

3.1.3 Recommendations

3.2 COI - 2

(list additional COIs in same sequence)

3.X SURVIVABILITY ASSESSMENT

3.Y ENVIRONMENTAL IMPACTS

IV DEFICIENCY REPORT

4.0 DEFICIENCY REPORT STATUS

4.1 IMPACT SUMMARY

4.2 PRIORITIZED DEFICIENCY REPORTS

V SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

GLOSSARY (if necessary)

REFERENCES (if necessary)

ATTACHMENTS

A OPERATIONAL ASSESSMENT

B EXECUTIVE SUMMARY OF PREVIOUS OT&E

NOTE: Details and explanations of the Recommended OT&E Final Report Content and Format are found in AFPAM 99-116.